

Kentucky
Agricultural Experiment Station
University of Kentucky

TYPES OF FARMING IN KENTUCKY

BULLETIN NO. 357
(Research Bulletin)



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Lexington, Ky.
June, 1935

TYPE-OF-FARMING AREAS IN KENTUCKY



THE CHARACTERISTICS OF THE VARIOUS AREAS ARE SHOWN ON THE OPPOSITE PAGE. FURTHER DETAIL AND THE CAUSAL BACKGROUND LYING BEHIND THOSE DIFFERENCES APPEAR IN THE ILLUSTRATIONS AND TEXT WHICH FOLLOW.

CHARACTERISTICS OF THE AREAS

Area	Name and General Description	Total Land in farms	Farm Land in			Livestock per 1000 Acres of Farm Land		
			Woods	Pas- ture	Har- vested Crops	All Cattle	Hogs	Sheep and Lambs
		Percent	Percent	Percent	Percent	Number	Number	Number
1. Mountains.	Subsistence Area (Corn, Hogs, Subsistence). Very rough topography, soil poor, small farms.	63	43	34	18	41	31	12
2. Eastern Pennyroyal and Knobs.	General-Farming Area (Corn, Dairy Cows, Sows, Poultry, Tobacco, Subsistence). Topography rolling to very rough, fair to poor soils, small farms.	77	34	32	26	42	39	32
3. Bluegrass.	Livestock and Tobacco Area (Bluegrass Pasture, Livestock, Tobacco, Crops). Smooth to rough topography, excellent to good soils, small and large farms.	89	10	62	26	78	66	242
4. Urban-Influence Areas.	(Truck Crops, Fruits, Dairying). Smooth to rolling to rough topography with excellent to good soils, small to medium sized farms.	72	10	47	34	95	49	67
5. Pennyroyal Plain.	Tobacco-Livestock Area (Crops, Tobacco, Livestock). Very smooth topography, good soils, large farms.	92	13	38	36	53	70	30
6. West Coal Field.	Subsistence Tobacco Area (Corn, Hogs, Tobacco Part-Time, Subsistence). Topography rolling to rough on upland and smooth on bottoms. Soil poor on upland, excellent on bottoms. Small farms.	76	25	29	27	37	32	19
7. Lower Ohio Valley.	Corn, Livestock, and Tobacco Area (1. Corn, Tobacco, Hogs, Dairy; Small Farms. 2. Corn, Hogs, Hay, Pasture, Beef; Large Farms.) Rolling topography on upland, smooth on bottoms. Excellent to good soils.	83	8	30	44	51	116	23
8. Purchase Region.	Tobacco-General-Farming Area (1. General, Tobacco, Corn, Cow, Sow, Poultry, Subsistence; 2. Cotton, Corn; 3. Fruit, and Truck Crops). Gently rolling to rough topography on upland, smooth on bottoms, soils good to poor on uplands, bottoms excellent. General farms small to large; cotton farms large.	81	14	30	36	64	68	27
State average		78	24	41	27	55	52	80

PREFACE

Differences in the types of farming in Kentucky, in a broad sense, are evident to the most casual observer. The underlying causes and resulting association of crops, livestock, and pasture, however, are not so easily recognized. It is hoped that this bulletin will be of value in pointing out these influences and the resulting relationships.

For the purposes of analysis, the farming of the state has been divided into eight type-of-farming areas, and these have been further divided into twenty-three subtypes. The names given are taken from common usage but may or may not apply to the same area with which the name has been used heretofore.

The information upon which this study is based has been gathered from numerous sources, including Federal Census reports, publications of the Kentucky Agricultural Experiment Station, historical texts and treatises, conferences and conversations with numerous persons, and observation in the field. Wherever possible, statistical material was used and, except where otherwise noted, such material is from the 15th Federal Census, 1930. In a few instances some interpolation was necessary in order to maintain the continuity of the description in presenting each area and subarea in its relative position with respect to the whole.

Since it is quite impossible to go into great detail in describing each subarea of the state, it is suggested that those who desire further information write to the Department of Farm Economics, Kentucky Agricultural Experiment Station.

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INTRODUCTION

The agriculture of Kentucky ranges from the simple subsistence type in which the products are consumed at home to the highly commercial kind in which the products are to be sold; from the farming which produces only crops to that which produces only livestock and livestock products. Farms of a given type may be found in widely separated parts of the state or may be concentrated in a well-defined area almost to the exclusion of other types. An area in which a given type predominates is called a type-of-farming area.

The object of the study reported in this bulletin is to ascertain what types of farming are found in the state, to define the areas in which certain types predominate, and to learn the causes which produced these type-of-farming areas. The findings should aid in a better understanding of Kentucky agriculture and make for more effective extension work, teaching, and research, and better use of resources by farmers.

BULLETIN NO. 357

Types of Farming in Kentucky

By BRUCE POUNDSTONE and WALTER J. ROTH*†

CHARACTER OF THE AGRICULTURE

Kentucky's agriculture dates from 1774 when the first settlement was established at Harrodsburg, in what is now Mercer county. The settlement of Kentucky developed from the westward movement of the growing population on the Atlantic seaboard. Pushing past the inhospitable ridges of eastern Kentucky into the central part, the pioneers settled in the fertile area now known as the Bluegrass. Other settlements quickly followed Harrodsburg and by 1792, when Kentucky was admitted to the Union as a state, the Bluegrass had 125 settlements.

The other portions of the territory were settled somewhat later, but altho that area in the western part of the state now known as the Pennyroyal was early recognized as having considerable merit, it was virtually uninhabited up to 1780. St. Asaph, near the present site of Stanford, was established in 1775, Elizabethtown about 1780. By 1790 settlers to the number of 4,000 or 5,000 had penetrated the Pennyroyal from those two settlements as well as from others.

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† The authors express their appreciation to county agents, Smith-Hughes teachers, members of the staff of the Kentucky Agricultural Experiment Station, farmers, and many others who lent their aid and earnest cooperation thruout the development of this study, and gratefully acknowledge the active interest of Dr. W. D. Nicholls, Head of the Department of Farm Economics, and Dr. C. L. Holmes, in charge, Division of Farm Management and Costs of the Federal Bureau of Agricultural Economics, and their many helpful suggestions while directing this project. All the charts and maps in this bulletin were prepared by the Graphic Section of the Bureau of Agricultural Economics, under the direction of R. G. Hainsworth.

The settlement of eastern Kentucky did not take place until the last decade of the 18th century, primarily because of the rough topography and the poor soil, a contrast to the smooth, rolling lands of the Bluegrass and the Pennyroyal. Catlettsburg was not settled until 1807, tho some settlements in the Big Sandy Valley were made prior to that date.

The farming of these early Kentucky settlers was, of necessity, the self-sufficing type. Little agriculture was possible, except the raising of corn, beans, pumpkins, and melons in the clearings. The principal implements of the pioneer were the axe, the hoe, and the sickle or scythe. Gradually agriculture expanded to include livestock under open range conditions and the keeping of cows to supply milk to the household. The first crop of wheat in Kentucky was harvested in 1777 from a patch of four acres near the walls of the Harrodsburg settlement. The first gristmill was erected in 1782. Potatoes, turnips, and garden vegetables were added to the restricted resources. Hemp, flax, and cotton were planted and orchards set out. For a number of years the media of exchange consisted largely of commodities, including furs, whisky, handwoven textiles, and tobacco. By 1790 barter economy in Kentucky was changing to a money economy altho, as in most pioneer communities, money was scarce. Gradually sufficient land was cleared to permit production of a considerable market surplus. The distance and the limited transportation facilities at that time precluded sending to market many of the products from the soil of Kentucky. The markets available to these settlers in the last two decades of the 18th century were the eastern seaboard cities and towns, New Orleans, the West Indies, and Europe. To reach any one of these points a long overland trip eastward or by boat via the Ohio and Mississippi rivers to New Orleans was necessary. The length of time involved in transport prohibited sending perishables. The high cost of transport prohibited sending any but products with a high market value. However, surplus products did go to these markets as evidenced by the flatboat load of hams, butter, and tobacco shipped to New Orleans from the

vicinity of Frankfort in the spring of 1787. Later shipments included flour and bacon. These goods were exchanged for money and merchandise, particularly necessities which the settlers could not supply for themselves locally, such as the goods of Europe, the West Indies, and New Orleans.

Interest attaches to this early commerce not for itself but because of the agricultural activities implied: the production of wheat, dairy cattle, and swine. Both cattle and swine involve feed production including corn and hay, altho hogs roamed at will, feeding on the abundant mast of the forests, and the cattle grazed on the open land.

Altho most of Kentucky's settlers possessed only modest means, there were some with ample means who acquired and operated large areas of land. Such men were attracted to the areas of good soil, satisfactory topography, and navigable rivers. This is corroborated by the concentration of the slave population, as shown for the years 1790, 1800, and 1860 (Fig. 1).

With the growth of Kentucky's agriculture, a great many cattle, hogs, horses, and mules were driven directly to market. The driving of cattle and hogs came to be a specialized employment with more or less standardized practices. The stock were concentrated at Lexington and Paris for driving to the southeastern plantation regions and to western Georgia and Alabama. Large numbers were driven along the Big Sandy, the Upper Ohio, the James, and the Potomac valleys to the markets of the north Atlantic states or of eastern Virginia. In the two decades prior to the Civil War the driving of hogs and cattle diminished because of pork and beef packing establishments at Louisville, Cincinnati, and Nashville. The lower Mississippi markets took large numbers of hogs in the form of pickled pork, mainly shipped down the Mississippi river.

Of the major crops of the early farming in Kentucky, tobacco, corn, and livestock feeds remain. Hemp, formerly important, has practically disappeared. Wheat, too, has become less important; in 1929 only five percent of the Kentucky farmers reported growing it.

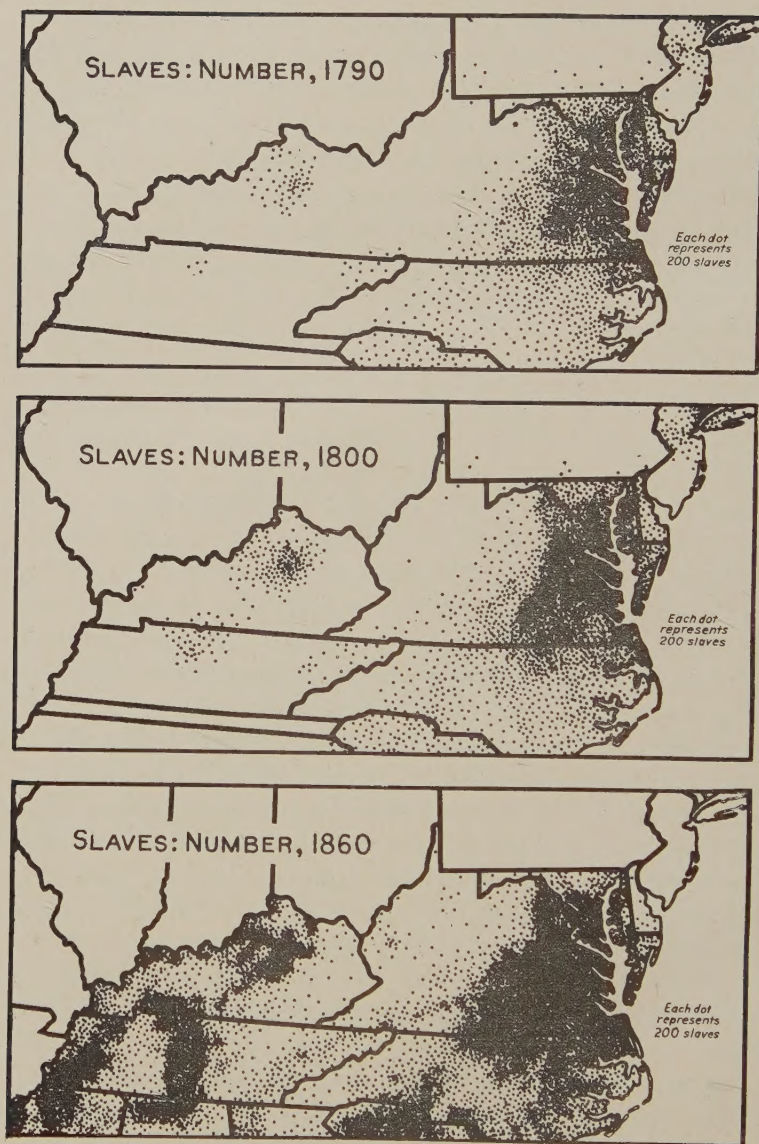


Fig. 1. Distribution and number of slaves.

According to Fig. 2, a little over three-fourths of the land area of the state is in farms. Land not in farms consists largely of coal and timber holdings and of poor land such as rock out-crop or broken territory of little agricultural value, railroad and



Fig. 2. Utilization of land in Kentucky, 1849-1929.

highway rights of way, and land used for towns, cities, parks, game refuges, and other non-farm purposes. The area of land now in farms, as is evident from Fig. 2, is smaller than it was in 1910 when almost 90 percent in farms was reported. The figure for 1930 is the lowest since 1870.

Changes in the composition of the land in farms since 1850 also are shown in Fig. 2. The amount of improved land¹ decreased simultaneously with the decline of tillable farm land. Altho there was a general increase in acreage of improved land from 1850 to 1910, the most rapid increase came in the period from 1880 to 1910, probably as a result of the post Civil War expansion. The acreage in the harvested crops—corn, all small grain, hemp, tobacco, and hay—had a more gradual rise and only recently has begun to decline. These harvested crops occupy about one-fifth of the total land area, or about one-fourth of the farm area at the present time, and compose 94 percent of all harvested crops. These proportions are but slightly different from those given by the census of 1880. As shown in Fig. 2, an increase in crops harvested followed 1880 and reached its highest point in 1900. The decline, evident in 1910, was arrested in 1920, only to reappear in 1930 as a continued trend.

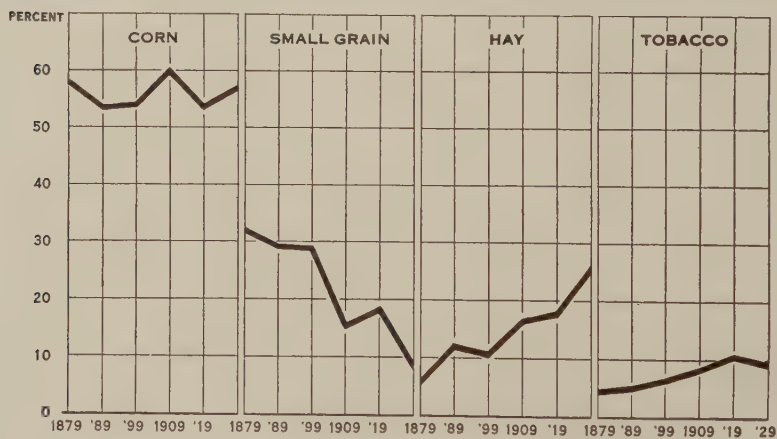


Fig. 3. Distribution of land in Specified Crops, in Kentucky.

In Fig. 3 the changes are shown in the proportion of the crops harvested in the various census years. Corn, altho varying somewhat, retained its position of more than half of the total. The proportion of small grain, however, decreased

¹ Improved land is no longer reported in the census as such but may be taken as crops harvested, idle crop land (plus crop failure) and plowable pasture. To this should be added a small figure for the farmstead.

definitely and almost continuously, and is now barely one-fourth of the proportion for 1880. The proportion of hay increased almost fivefold, from 1880 to 1930, and that of tobacco doubled in the last fifty years.

Figure 4 shows the changes in the number of livestock per 1,000 acres of farm land. The most outstanding change was in the number of swine, reported as 136 in 1850 and only 52 in 1930.² This decrease in the number of hogs in Kentucky accompanied and undoubtedly was occasioned by the opening of the great corn-growing regions of the prairie states, which since then have become the chief corn and hog producing areas of the nation. This shift away from swine production in Kentucky was accompanied in 1880 by an increase in the number of cattle, sheep, and poultry. Part of the increase in all cattle production was due to an increase in the number of dairy cows. Work animals have not changed materially over the period of available figures.

The increase in the number of dairy cows, is of particular importance inasmuch as, from 1850 thru 1880, cows were probably kept chiefly for family use. Following 1880 the number gradually increased to almost double, indicating the production of market milk and cream; in other words, commercial dairying.³

This increase in cows, all cattle, and sheep is associated with the increase in hay, as seen in the crop picture in Fig. 3. Of particular interest is the continuance of corn production at about the same figure over the period of the available data. A continuation of corn production was necessitated not only by its high acre-value, in comparison with other crops possible in the same area, but also by the diversity of its feeding uses, which increased as hog production decreased. Much of the corn was

² Some changes in numbers have resulted from changes in the date of enumeration. For example, the enumerations from 1850 to 1900, inclusive, were as of June 1st. For 1910 the date was April 15; for 1920 and 1925, January 1; for 1930, April 1. January enumerations would report smaller numbers of poultry, feeder swine, and lambs than those of spring months or those of summer. The number of dairy cows probably was little affected by these changes. Beef feeding animals probably were more numerous on January 1 than in the summer.

³ The recent increase in number of milk cows is due in part to a more rigid classification in the census.

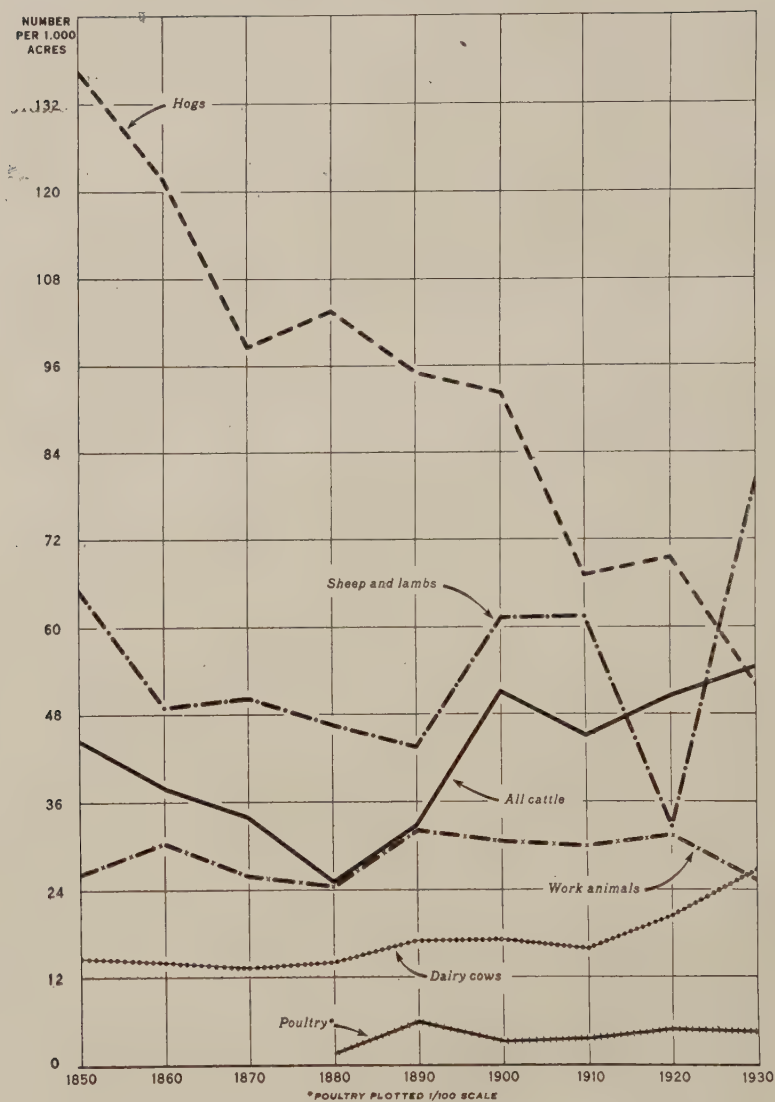


Fig. 4. Livestock per 1000 acres of farm land, in Kentucky.

used as food for man also, especially in the areas where farming was of the subsistence type.

Present Use of Land. Of the land area of the state, 77.5

percent is in farms. This land in farms, however, is not all available for crop production or even for crop and pasture use; parts of it fall into the classifications, "woods not pastured" and "other farm land."⁴ (Table 1 and Fig. 8.)

Of importance in considering the agriculture of Kentucky is the proportion of farm land that is reported as tillable. This is the potential crop land, classified in the census as crop land and plowable pasture. A little over three-fifths of Kentucky's farm land is reported as tillable. The remainder is not tillable because of wooded cover, stoniness, roughness, or lack of drainage. Woodland makes up almost one-fourth of the area in farms, including a large proportion of the untillable land. Undoubtedly much eroded land, once woodland but now cleared for crops or pasture, is reported as tillable because of this former use for crops. Clearing is still proceeding in many parts of the state on both hillsides and bottoms. Much of the slope land should never have been cleared; it should be allowed to go back to woods if not actually replanted to trees. The area reported as tillable, therefore, is larger than good farm practice would justify.

Of importance also is the area in harvested crops plus total pasture since these two elements constitute the productive use of farm land affecting both crops and livestock. It constitutes about two-thirds of the farm land of the state. Altho a trifle over one-third of the farm land is reported as potential crop land, idle land reduces the figure for harvested crops to about one-fourth of the farm land area (Table 1).

Pasture alone occupies more than half again as much land as is used for harvested crops. The designation "pasture" is not accurate and probably includes much relatively unproductive land in some of the areas. However, it does represent the attempt to use the land surface and, for the state as a whole, it is significant that a larger part of the farm area is reported as pasture than is reported as harvested crops. Generally the land that is unfit for crops, that is land classed as not plowable,

⁴ Other farm land is land used for farmsteads, building sites, lanes, etc.

Table 1. Farm Land. Distribution into Land-Use Classes. 1930.¹

Land-Use Class	Distribution	
	Acres	Percent
Harvested crops	5,330,821	26.8
Idle, failure, and fallow	1,596,094	8.0
Total crop land	6,926,915	34.8
Plowable pasture	5,394,648	27.1
Woods pasture	1,402,831	7.0
Other pasture	1,322,477	6.6
Total pasture	8,119,956	40.7
Woods not pasture	3,393,795	17.0
Other farm land	1,436,620	7.5
Grand total	19,927,286	100

¹ Data from U. S. Census.

is left for pasture. Of the pasture land, however, almost three-fourths is reported as plowable pasture, an indication that a fairly large proportion of presumably potential crop land is used for pasture (see page 47). The remainder of the pasture is almost equally divided between woodland pasture and other pasture. This "other" pasture is apparently too rough or too stony for cropping and hence is used for permanent pasture.

Crop Enterprises. Harvested crops in Kentucky (Table 2) include a well-diversified list of crops. Emphasis is placed on corn, which, as in the preceding census periods (Fig. 3), was designated as occupying more than half of the total acreage of harvested crops. In comparison with proportion of land in corn, proportions in tobacco, small grain, and other crops are small. Most of the corn is used for feeding, so it does not appear directly in the income figures. For these same reasons oats, rye, hay, and part of the wheat are not placed in the income figures. Hence a large proportion of Kentucky's cropping is of the type used as feed for livestock. Approximately three-fourths of Kentucky's harvested crops are feed crops, and the remainder cash crops. Of these cash crops tobacco represents more than one-third of the area total. This division

between crops produced for feed and crops produced for sale, with tobacco the leading cash crop, in a measure distinguishes Kentucky agriculture as a tobacco-livestock type.

Table 2. Harvested Crops. Average and Percentage Distribution. 1930.¹

Crop	Crop Area	Percentage of	
		Crops Harvested	Farm Land
	Acres	Percent	Percent
Crops other than hay:			
Corn	2,843,222	53.3	14.3
Tobacco	466,118	8.8	2.3
Oats	206,900	3.9	1.0
Wheat	204,131	3.8	1.0
Rye	17,604	.3	.1
Cotton	15,898	.3	.1
Potatoes	49,250	.9	.2
Vegetables harvested for sale	21,971	.4	.1
Nuts, orchards, and small fruits	112,284	2.1	.6
Remainder	118,909	2.3	.7
Total	4,056,287	76.1	20.4
Hay crops:			
Timothy, and timothy and clover mixed	511,946	9.6	2.6
Clovers alone	152,850	2.9	.8
Alfalfa	98,355	1.8	.5
Remaining hay	511,383	9.6	2.5
Total	1,274,534	23.9	6.4
Total harvested crops	5,330,821	100	26.8

¹ Data from U. S. Census.

Legume hays occupy approximately one-third of the hay area (Table 2). Timothy alone represents the dominant constituent of the classification: timothy and timothy and clover mixed. The lack of adequate lime in most of Kentucky's soils restricts the production of legume hays and forces the farmer to grow less valuable grass hays, as timothy, redbud, wild hay, etc.

Livestock Enterprises. The livestock enterprises are shown in the figures in Table 3. It is evident that cattle occupy a position of importance in Kentucky agriculture. Milk cows are more numerous than beef cows. The milk cows, the few beef cows and all other cattle, as well as sheep, are a means of using the pasture already noted under land use. Hogs accompany corn production and dairying of the butterfat type where skim-milk is a by-product. Poultry is a minor enterprise.

Table 3. Livestock and Livestock Products per 1,000 Acres in Farms. 1929.¹

Kind	Number
Cows and heifers 2 yrs. old and over, kept mainly for milk	26.7
Cows and heifers 2 yrs. old and over, kept mainly for beef	2.9
All other cattle, calves, steers, bulls	24.9
All cattle	54.6
Sheep and lambs	80.2
Sows and gilts farrowing	4.2
All swine	52.3
Chickens 3 months old and over	448.0
All work stock	24.3
Gallons of whole milk sold	1953.0
Pounds of cream sold as butterfat	1136.0
Number of dozen eggs sold	1704.0

¹ Data from U. S. Census.

Gross Value of Product. More than one-third of the gross value of product⁵ of Kentucky's farms in 1929 (Table 4) was derived from crops, more than one-fifth from livestock, and about one-seventh from livestock products. Livestock and livestock products combined compose more than one-third of the total and one percent more than the portion obtained from crops. The number representing livestock and livestock products would

Table 4. Sources of Gross Value of Farm Products. 1929.¹

Source	Amount	Percent
Crops	\$ 83,323,887	36
Livestock	49,435,253	22
Livestock products	34,001,674	15
Forest products	2,802,221	1
Household use	59,135,901	26
Total	\$228,698,936	100

¹ Data from U. S. Census.

be appreciably higher if the value of such products furnished for the household were added to it. The amount could easily be one-half or more of the 26 percent, of the total gross value of products, which represented household products.⁶ Thus the

⁵ Gross value of product is the value of crops, livestock, and livestock products, sold or traded, forest products sold, and products used by the operator's family, as reported in the 15th Federal Census, 1930. Receipts from boarders, lodgers, and campers were not considered in obtaining this figure.

⁶ Farm business analysis studies for Kentucky indicate that well over one-half of the value of products furnished by the farm for family use are from livestock when house rent is not considered as the census figures here quoted.

livestock could be credited with more than one-half of the total gross value of product of the farms of the state.

Kentucky's agriculture may be described as a livestock-crop type. The more important classes of livestock are cattle, hogs, sheep, and poultry. The principal livestock products sold are milk, butterfat, wool, and eggs. Crops sold, in the order of their importance, are tobacco, wheat, corn, fruits, and vegetables.

FORCES AFFECTING KENTUCKY AGRICULTURE

The type of farming in any area, tho seemingly haphazard in growth, in reality has conformed to forces within and without the region. These forces may be termed physical, biological, social, and economic. Differences in topography, soil, and climate dictate different land-use relationships which, in turn, govern the type of farming and the number and kinds of livestock to be kept. Man's ability or inability to overcome biological handicaps definitely places limitations on his agricultural activities. Nearness to market, good roads, the demand for the farmer's products, and his readiness and ability to respond to these conditions are some of the other forces directing agricultural development.

Physical Forces

Topography. A large proportion of the state has a rough or very rough topography. The physiographic diagram (Fig. 5) designates the terrain of the eastern fourth of the state as very rough and broken, the Western Coal Field as rough and broken, and the southeastern Pennyroyal, Knobs, Intermediate Bluegrass, and Breaks near the rivers as broken. The Jackson Purchase has a rolling surface. Topography is gently rolling in the Inner and Outer Bluegrass and level in the southern and western Pennyroyal and the bottom lands in all parts of the state, particularly extensive along the Ohio river. The names applied to these areas and the accompanying topographic features are referred to frequently thruout this report.

Soils. The soils of the state also show great variation.

PHYSIOGRAPHIC DIAGRAM OF KENTUCKY

ADAPTED FROM LOBECK



TOPOGRAPHIC CHARACTERISTICS OF PHYSIOGRAPHIC REGIONS

Eastern Coal Field	Very Rough	Bluegrass:	Gently Rolling
Western Coal Field	Rolling to Rough	Inner	Rough and Broken
Knobs	Rough and Broken	Intermediate	Gently Rolling to Rough
Jackson Purchase	Gently Rolling to Rough	Outer	Level
Pennyroyal	Plain-like to Rough	Bottoms	

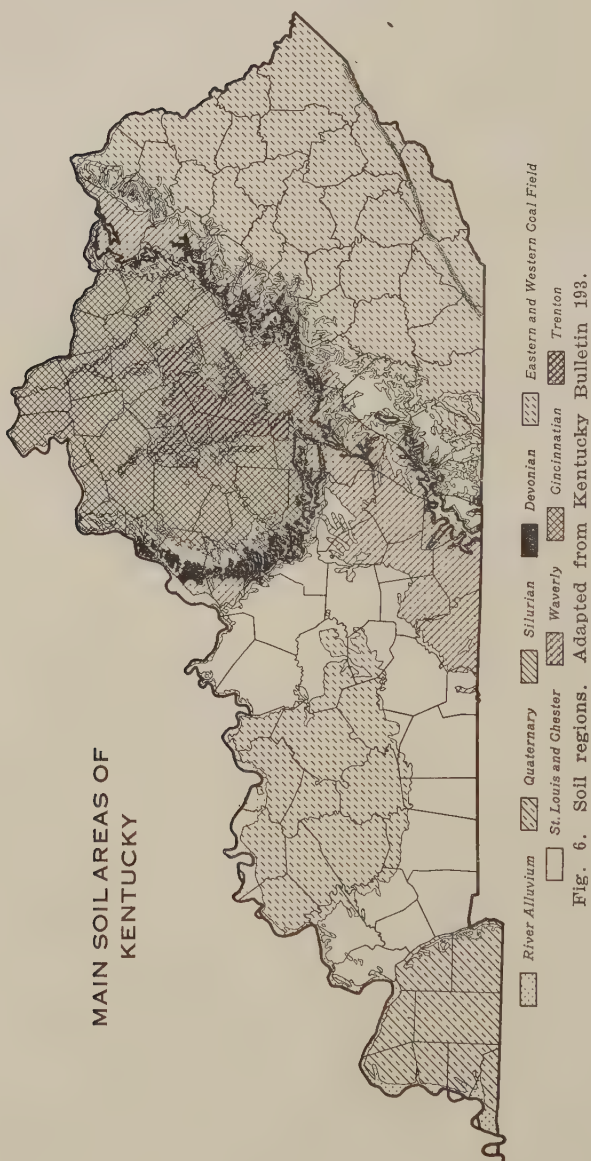
Fig. 5. Physical features.

They range in texture from sands and sandy loams thru silts and silt loams to clays. However, the proportion classed as sands and sandy loams is not large. The greater part is residual tho some soils were transported. On the map in Fig. 6 the soil areas are indicated according to geologic origin.

Of the ten soil areas, all except the Trenton, and parts of the Cincinnati, and River Alluvium show a deficiency in phosphorus. Generally, where phosphorus is deficient, nitrogen is also deficient. Except in the Trenton, phosphorus and lime are generally limiting, and because of this fact the nitrogen content is low. The total potassium content is least abundant in soils of the Waverly, the eastern strip of the St. Louis, and the western edge of the Eastern Coal Field, but the ratio of easily soluble potassium is greater than in soils of higher content. With good rotations and proper cultivation, the supply is considered sufficient for most crops, tobacco and alfalfa being possible exceptions. In general, potassium is not a limiting element where drainage is good and a supply of organic matter is maintained. Most of the soils in the state originally were fairly productive. Except in the Trenton Area, rarely has their productivity been maintained and then only thru employment of the best farm practices.

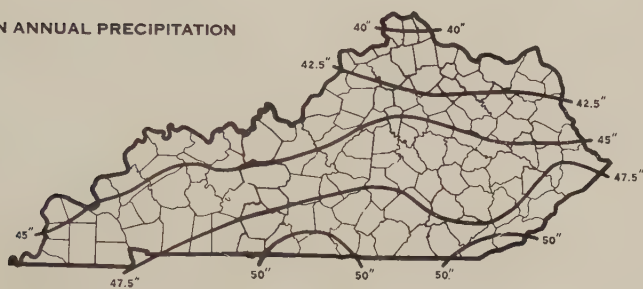
Climate. Kentucky has a climate of the warm, humid type with marked contrast between winter and summer and a rainfall that is considered heavy. (See Fig. 7, a, b, c.) The temperature, precipitation, and growing season are adequate for all corn-belt crops. Occasionally too much rain falls during the spring months. Droughty conditions prevail for a few weeks nearly every summer somewhere in the state, the Bluegrass, the lower Green River Valley, and the southwestern counties being especially subject to such periods. In a small area of southwestern Kentucky the temperatures and growing season permit cotton production.

Precipitation is a definite force in causing erosion. The rainfall, averaging about 45 inches, comes largely in the cooler two-thirds of the year when there is little evaporation. On



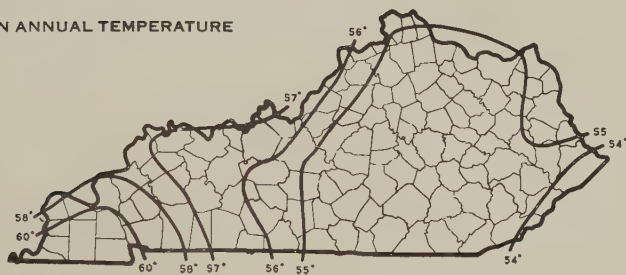
(A)

MEAN ANNUAL PRECIPITATION



(B)

MEAN ANNUAL TEMPERATURE



(C)

AVERAGE LENGTH OF SEASON
WITHOUT FROST

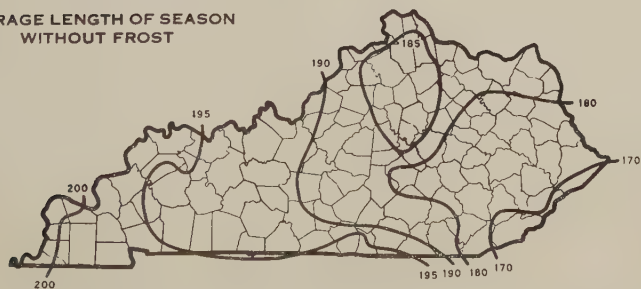


Fig. 7. Climatic factors. Adopted from Visser, S. S. *The Climate of Kentucky, Ky. Geo. Survey, Series 6, Vol. 31, pp. 81-167.*

unfrozen ground this is associated with considerable slope washing and soil movement.

Economic Forces

External Economic Forces. The external economic forces are those which lie outside of the farm and may be summed up in the price relationships applying to both the goods farmers buy and those they sell. Particularly affecting these price relationships are the markets, both local and distant, available to the farmer and the transportation to them.

Internal Economic Forces. The internal economic forces are termed supplementary, complementary, and competitive, referring to the relations of the farm enterprises to each other. The term comparative advantage is often used to refer to the relative advantage of given enterprises or combinations in different places and at different times. A combination of corn or tobacco with small grain and forage, as is common in the rotation of the better farming areas of Kentucky, using the land, labor, power, equipment, and management of the farmer to full capacity, is an example of the supplementary relation. Such a combination usually produces greater returns than an unbalanced one. A combination of crops or crops and livestock which contribute benefits to each other is said to exhibit complementary relations. Small grain, for example, serves often in seeding the following forage crop, thus giving the forage the protection of the grain crop. The forage crop, if a legume, may add to soil fertility. When two enterprises, as alfalfa and corn, require the land, labor, power, equipment, and management of the farmer at the same time, they are said to be competitive. Competition of this sort often prevents the entrance of the less important crop into the farming type combination.

Biological Forces

Weeds which affect crops, the insect pests and diseases which affect both crops and livestock, and the organic nature of both crops and livestock are biological forces limiting farming operations. Forces of this type are not always recognized in their

action because they are being held in check by a combination of crops or crops and livestock which has been worked out by experience. Such preventive measures as planting only root-rot resistant strains of white burley tobacco, seeding wheat after fly-free dates, regular dipping and drenching of sheep, and the vaccination of hogs are a few of the methods employed in overcoming biological forces that would alter the prevailing type of farming decidedly if allowed to act unchecked.

Social Forces

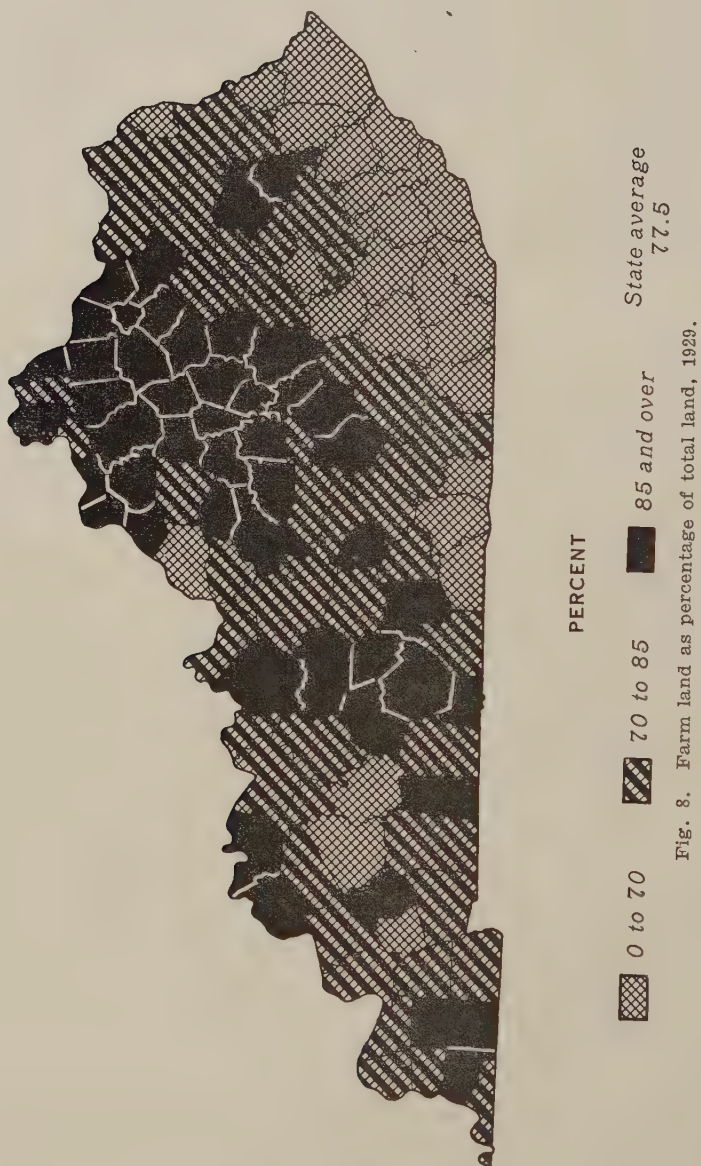
Social forces include man and the social order. The personal qualities of the farmer, his ability, inclination, experience, training, nationality, and his likes and dislikes, play a part in determining the kind of farming he selects.

Regional differences in types of farming may not always be traceable to social forces since they are less easily recognized than are the more evident topographic, soil, and climatic differences. Experience in growing a crop or handling livestock is often effective in keeping an enterprise on farms when other conditions might suggest its elimination, while lack of experience with a specialized crop or livestock enterprise has often acted to retard its adoption. Man, however, can and does learn to perform new tasks when it is judged that he can thus add to the returns of the farm.

From that which has been said concerning the forces affecting the type of farming, whether physical, economic, biological, or social, the impression might be given that these operate independently; this is not the case. These forces work inter-relatedly and often jointly to produce the result finally achieved. This result can be described in terms of land-use, livestock enterprises, the various crop and livestock combinations, and the influence of each in affecting the income of the farm.

TYPES OF FARMING

Differences in the farming of Kentucky, both past and present, are associated with differences in the physical and other features of the state. These forces at work have been presented



in some detail. The differences prevailing in these factors influencing the agriculture of Kentucky indicate the need of studying the farming of the state further in order to determine its local character and in order to associate the local differences in farming with the causal forces at work.

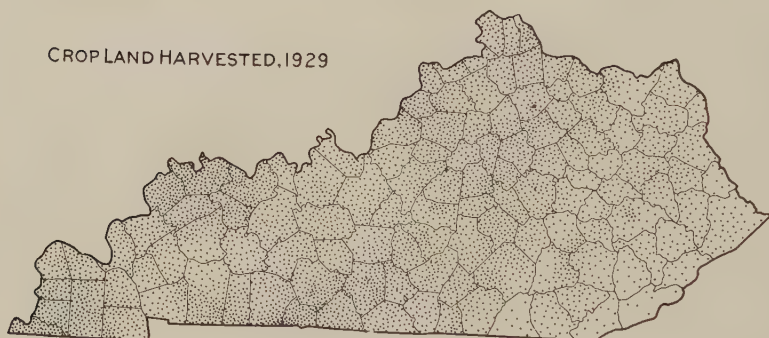
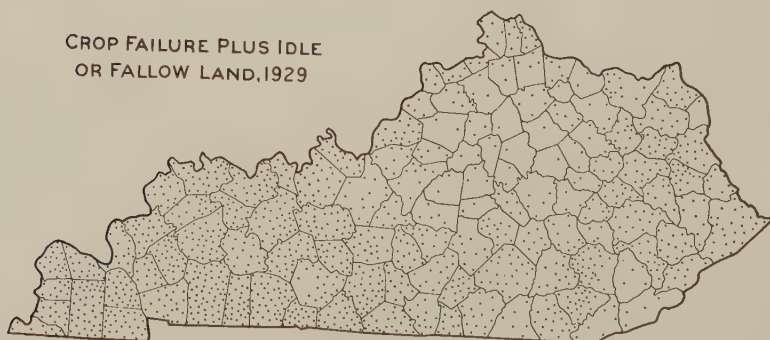
Thus, while for 1930, 77.5 percent of the total land area of the state is reported in farms, this figure varies from county to county as is shown in Fig. 8. The lowest figures are those for the "mountains," the Western Coal Field, a few of the other rough areas, and the section near Louisville. This is partly because of land held by timber and coal companies but chiefly because of the different quality of the land from an agricultural point of view, its different physical and economic productivity. The use of a large part of the land of a county for urban and suburban purposes leaves but little for farming.

Differences are likewise to be noted in the use of the farm land for harvested crops, in the land lying idle, in the area used for woodland not pasture, for other farm land, and for the crops, corn, tobacco, wheat, other small grain, hay, and the remaining crops (Figs. 9, 10, 11, 12). This is also to be seen in Figs. 13 and 14, showing the distribution of the various classes of productive livestock in the state. Areas of definite concentration of cattle, sheep, and swine with the areas of equally definite lack of concentration are evident. These differences in land-use and number of livestock are paralleled by Fig. 15, showing the gross value of product per acre of farm land in the various counties. Differences as great as from one to ten in this figure emphasize the existence of differences in the productivity of the farming of the state. Figure 16, giving the value per acre of farm land and buildings in the different magisterial districts, also shows differences in the productivity of the farming in Kentucky. A range of from \$12 to \$263 per acre, while indicative of differences in productivity, can also be associated with differences in type. These differences emphasize the necessity of studying the farming of the state in terms of the differences in the land-use, number of livestock, gross value of prod-

ALL LAND IN FARMS, 1929



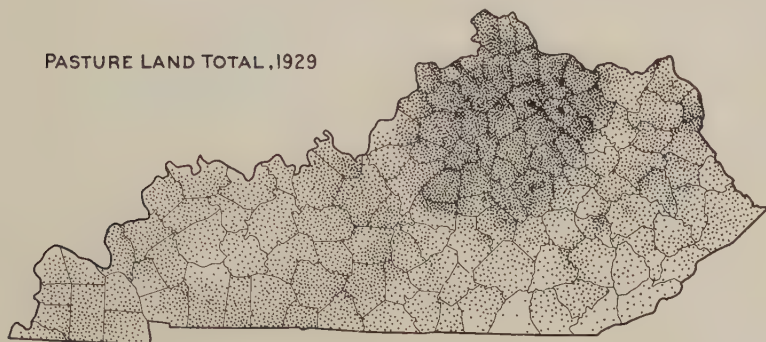
CROPLAND HARVESTED, 1929

CROP FAILURE PLUS IDLE
OR FALLOW LAND, 1929

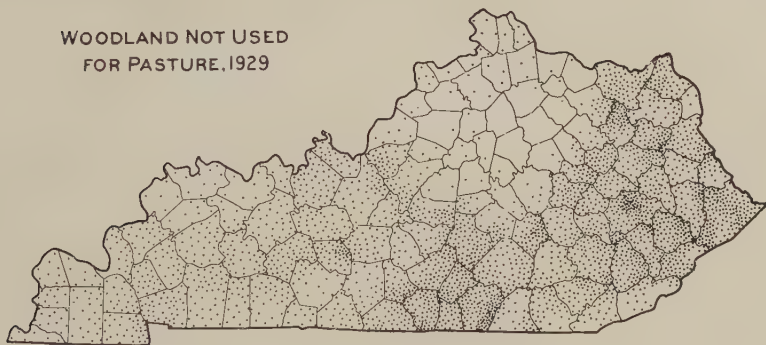
Each dot represents 1,000 acres

Fig. 9. Use of land, 1929.

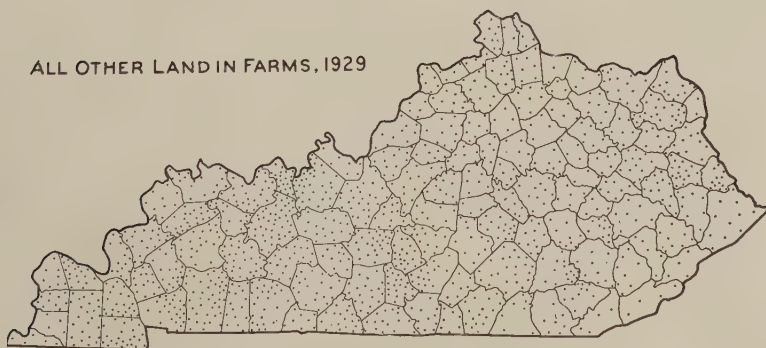
PASTURE LAND TOTAL, 1929



WOODLAND NOT USED
FOR PASTURE, 1929



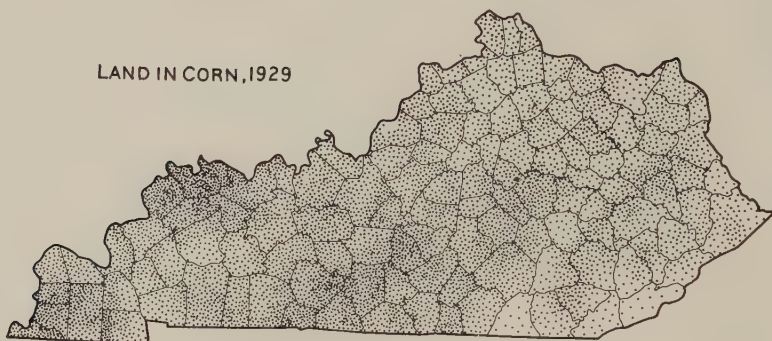
ALL OTHER LAND IN FARMS, 1929



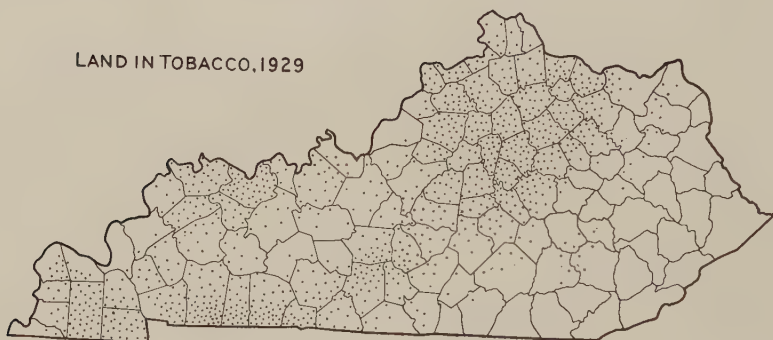
Each dot represents 1000 acres

Fig. 10. Use of land, 1929 (concluded).

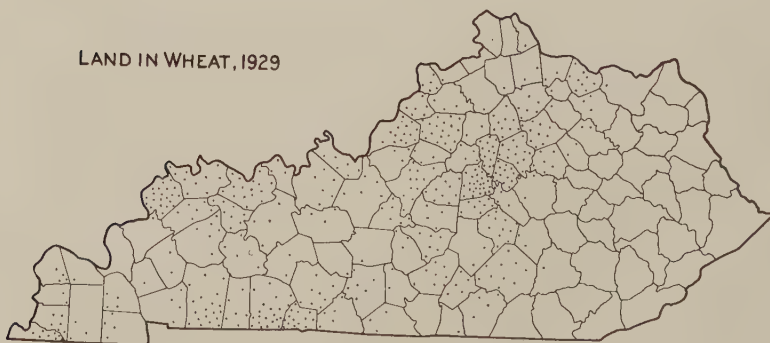
LAND IN CORN, 1929



LAND IN TOBACCO, 1929

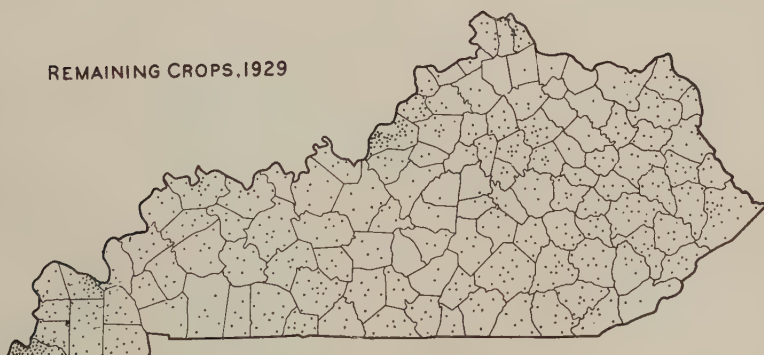
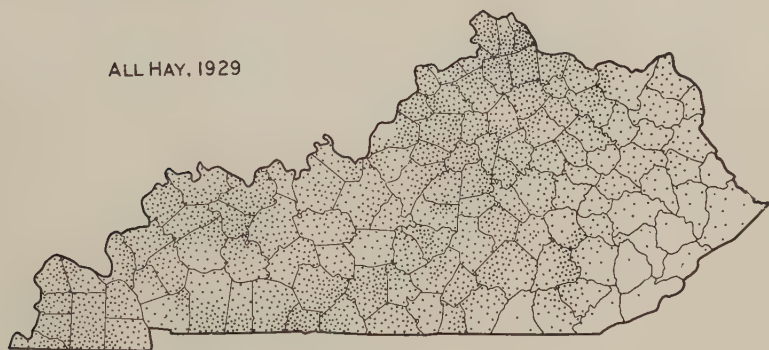
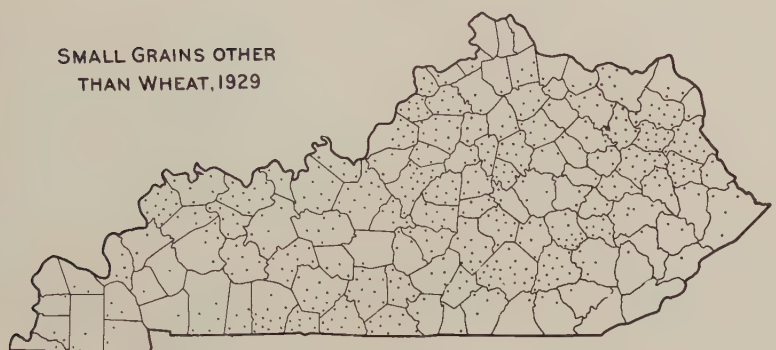


LAND IN WHEAT, 1929



Each dot represents 400 acres

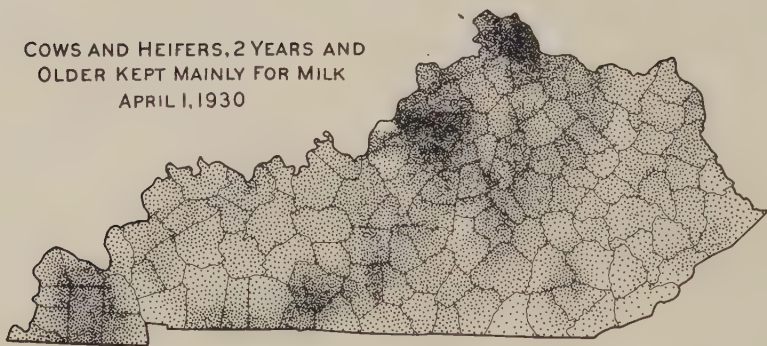
Fig. 11. Distribution of crops, 1929.



Each dot represents 400 acres

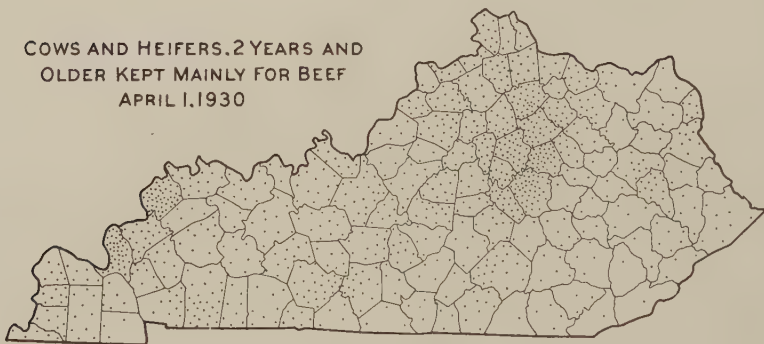
Fig. 12. Distribution of crops, 1929 (concluded).

COWS AND HEIFERS, 2 YEARS AND
OLDER KEPT MAINLY FOR MILK
APRIL 1, 1930



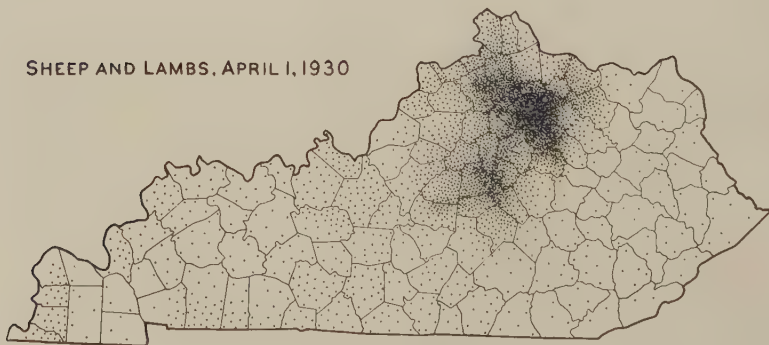
Each dot represents 50

COWS AND HEIFERS, 2 YEARS AND
OLDER KEPT MAINLY FOR BEEF
APRIL 1, 1930



Each dot represents 50

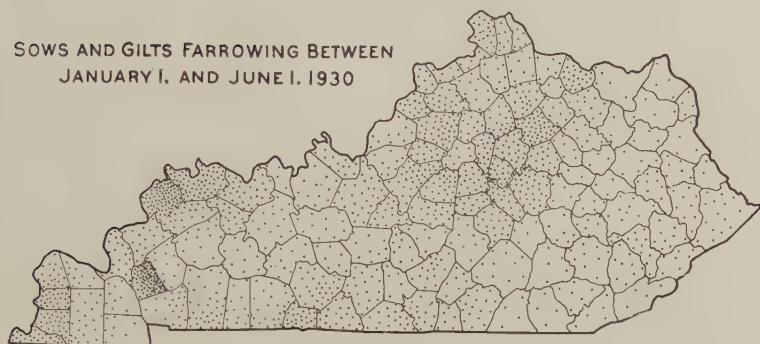
SHEEP AND LAMBS, APRIL 1, 1930



Each dot represents 500

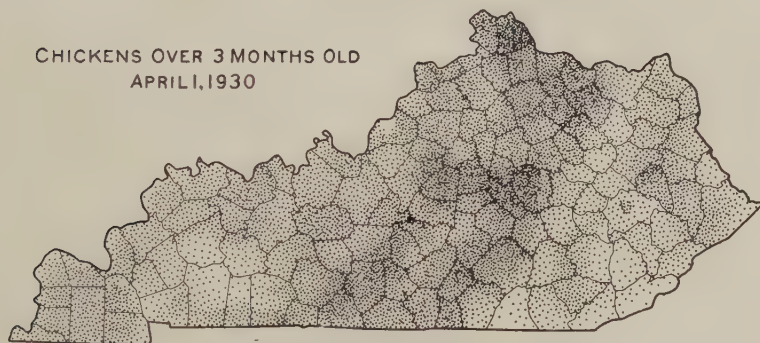
Fig. 13. Distribution of livestock, 1929.

SOWS AND GILTS FARROWING BETWEEN
JANUARY 1. AND JUNE 1. 1930



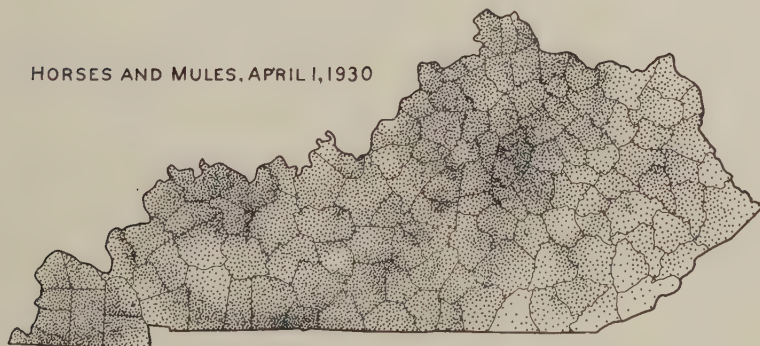
Each dot represents 50

CHICKENS OVER 3 MONTHS OLD
APRIL 1, 1930



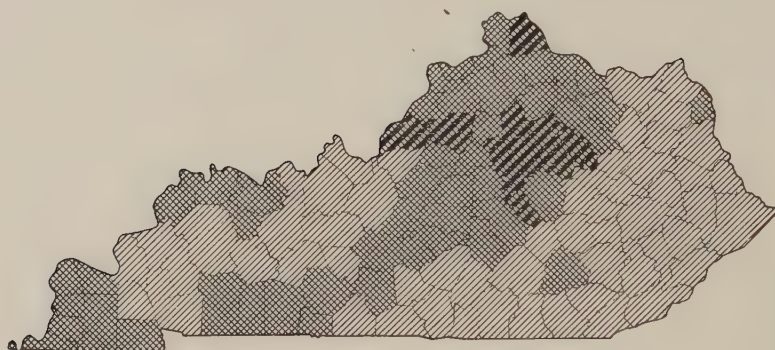
Each dot represents 1,000

HORSES AND MULES, APRIL 1, 1930



Each dot represents 50

Fig. 14. Distribution of livestock, 1929 (concluded).



DOLLARS PER ACRE

0 to 10

10 to 20

20 and over

State average
11.48

Fig. 15. Gross product value per acre of farm land, 1929.

ucts, and value of the real estate, in connection with the background of topography, soil, and climate as well as the economic and other conditions present. As these influences differ and the resulting land-use and combinations of livestock differ, corresponding differences arise in the type of farming followed.

REAL ESTATE VALUES PER ACRE
OF FARM LAND, 1930

DOLLARS PER ACRE

Under \$5

\$5 to \$25

\$25 to \$50

\$50 to \$75

\$75 to \$100 and over

Fig. 16. Real estate values.

The Type-of-Farming Classification of the Federal Census. Information on the types of farming in Kentucky is available in the classification of farms into types as given in the Federal Census of Agriculture, 1930, and shown in Table 5. According

to the numerical importance of these types, Kentucky's farming falls into a group of commercial types, including about seven-tenths of the total, and into a relatively non-commercial type, including the remainder which are termed self-sufficing farms. The commercial types, in the order of their numerical importance, are as follows: Crop-specialty (tobacco farms), general (tobacco farms with some other enterprise or enterprises of practically equal rank), abnormal farms (principally part-time and horse farms in Kentucky), animal-specialty (livestock farms, selling beef, hogs, sheep, or combinations of these), dairy, cash grain, poultry, cotton, truck, fruit, and stock ranch. Farms upon which a larger share of the total produce is consumed on the farm than is sold are classed as self-sufficing. The characteristics of the various types may be seen from the figures in Table 5 and by comparison within the type, or between types.

Tobacco is not grown in all parts of Kentucky, as an inspection of Fig. 11 shows. The "mountains" and parts of the Western Coal Field, the Pennyroyal, and the Lower Ohio Valley are conspicuously low in tobacco. This helps to explain the distribution of crop-speciality and general farms in the state (see Fig. 17). Crop-speciality farms are largely in the Bluegrass, the Pennyroyal Plain, and parts of the Eastern Pennyroyal, parts of the Purchase, and the Lower Ohio Valley. General farms are, to a large extent, in these same areas and similarly in the intermediate sections lying adjacent to the areas of concentration of crop-specialty farms.

The animal-specialty farms, that is, farms producing and selling sheep, hogs, beef, or combinations of these, are in the Lower Ohio Valley, the Bluegrass, the western part of the Purchase, and parts of the Pennyroyal (Fig. 18); this distribution corresponds with the location of livestock, as shown in Figs. 13 and 14, and with the location of ample pasture, corn, and hay, shown in Figs. 10, 11, and 12.

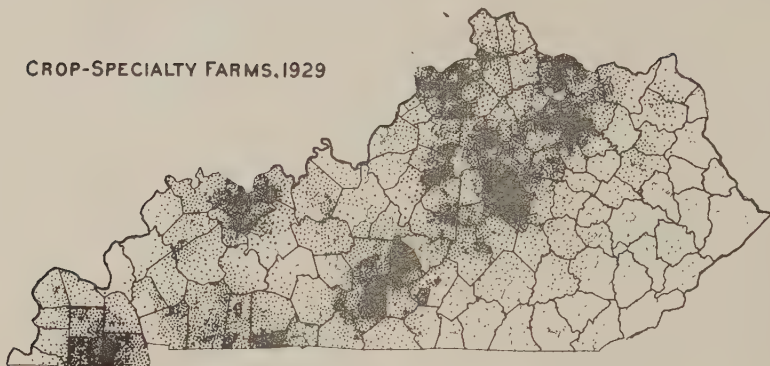
The dairy farms, in the areas of the concentration of milk cows (Figs. 13 and 18), are either the city market-milk farms

Table 5. Characteristics of Types of Farming in Kentucky (Concluded). 1930.¹

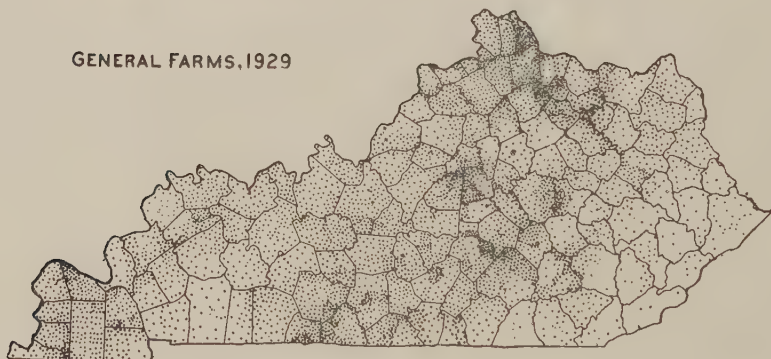
Type of Farming ²	Distribution of the Total						Size of Farms ³		Value of Land and Buildings per Acre	Gross Value of Products per Acre	Percentage of Farm Land in Type in	
	Number of Farms ⁴		Farm Area	Gross Value of Product	Real Estate Value	Plow-able Pasture					Harvested Crops	
	Original	Revised					Acres	Dollars	Percent	Percent		
		Percent	Percent	Percent	Percent	Percent	Acres	Dollars	Percent	Percent		
Self-sufficing	30.9	37.1	24.4	12.7	12.5	66	71	24	6	18.7	20.3	
General	20.6	21.8	24.9	21.7	21.1	101	124	39	10	27.5	28.0	
Crop-specialty	28.8	19.5	26.9	35.5	30.1	78	150	51	16	28.8	33.6	
Abnormal	9.2	9.7	6.1	8.1	12.9	56	68	67	16	27.0	19.8	
Animal-specialty	5.1	6.4	10.7	12.8	13.7	175	180	59	14	39.4	28.1	
Dairy	2.6	3.2	3.5	5.3	5.1	114	119	66	13	35.6	29.0	
Cash-grain	1.2	.8	1.7	1.4	1.8	119	220	49	10	17.5	44.5	
Poultry	.6	.7	.5	.5	.6	70	74	47	14	27.8	23.5	
Truck	.3	.4	.2	.5	.6	46	57	57	32	12.1	45.3	
Fruit	.2	.2	.2	.5	.4	82	100	77	25	20.2	41.8	
Stock-ranch	.2	.2	.3	.7	1.1	412	417	57	9	58.4	8.2	
Cotton	.3	.4	.1	.3	.2	50	395	71	26	8.3	71.7	
Average or total for all farms	100	100	100	100	100	81	113	44	11	27.0	26.8	

¹ Data from U. S. Census. Unclassified farms were omitted.² For a definition of the classifications used see page 52. If a more detailed discussion is desired, refer to "Types of Farming in the United States," United States Department of Commerce, Bureau of the Census, by F. F. Elliott, pp. 5-9.³ The census definition of a farm included as separate farms, land operated by a tenant, renter, cropper, or manager. In farm management, tobacco tenants, croppers, etc., are usually considered part of larger farm units, not operators of separate farms. The total number of farms reported by the Census is exaggerated from a farm management standpoint. The column headed "Original" in the table is based upon the number reported in the Census, whereas the "Revised" column has taken into account the difference in definition and reduced the Census figure.⁴ Less than one-half of one-tenth percent.

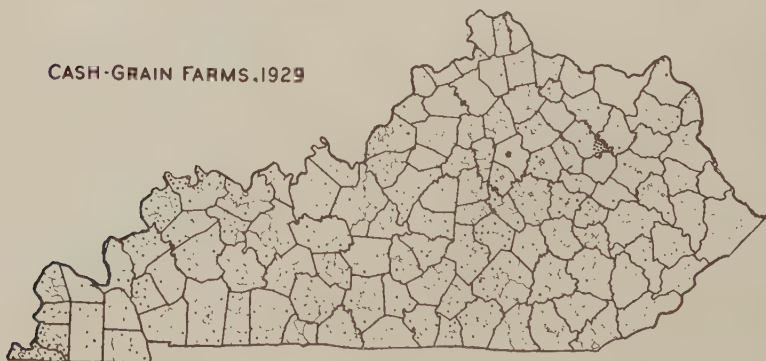
CROP-SPECIALTY FARMS, 1929



GENERAL FARMS, 1929



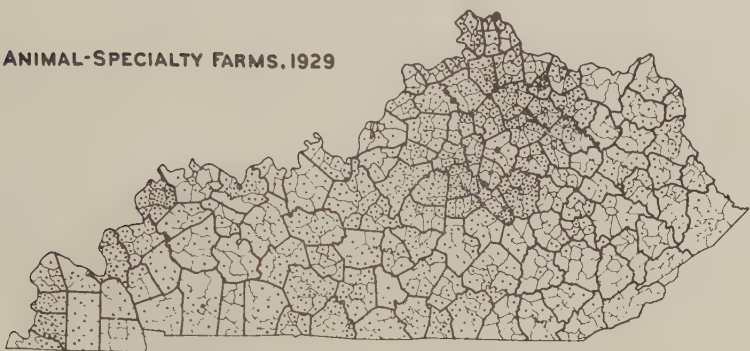
CASH-GRAIN FARMS, 1929



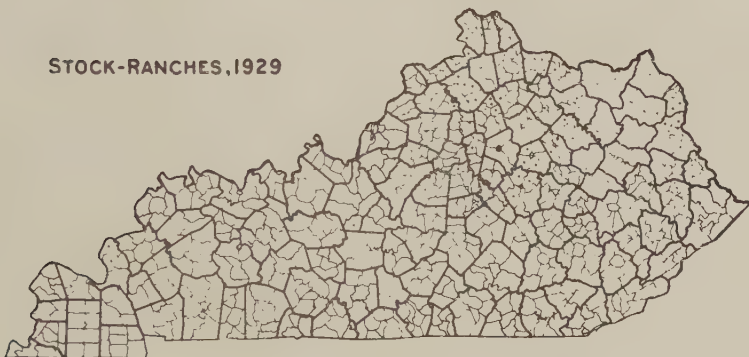
Each dot represents 10 farms

Fig. 17. Distribution of farms.

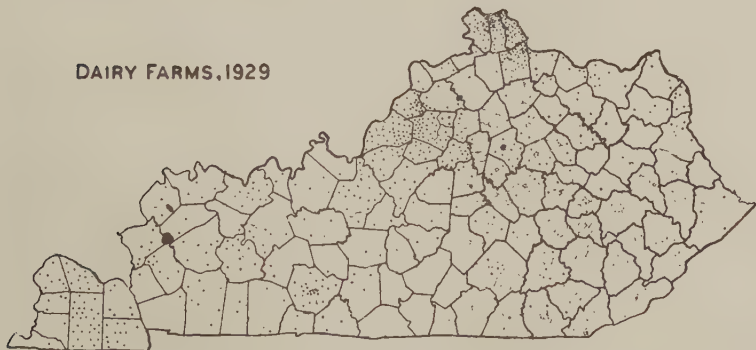
ANIMAL-SPECIALTY FARMS, 1929



STOCK-RANCHES, 1929



DAIRY FARMS, 1929



Each dot represents 10 farms

Fig. 18. Distribution of farms (continued).

near the major cities, such as Cincinnati, Louisville, Paducah, and Ashland, or the whole-milk farms near processing plants located at such points as Mayfield, Murray, or Bowling Green. Near the cities appear also the other specialized farms, those of the truck growers, the fruit growers, and a few specialized poultry farms. (Fig. 19). The poultry farms do not show as high a degree of specialization as the others and they are more scattered over the state. This suggests that they are not so much a matter of specialization, induced by nearby city markets, as of intensity, which may have resulted from the desire of particular individuals to push the poultry enterprise further on general farms in the more generalized farming areas of the state.

The cotton farms, chiefly in Fulton County (Fig. 20), show striking characteristics which differentiate them from all other farms in Kentucky (Table 5).

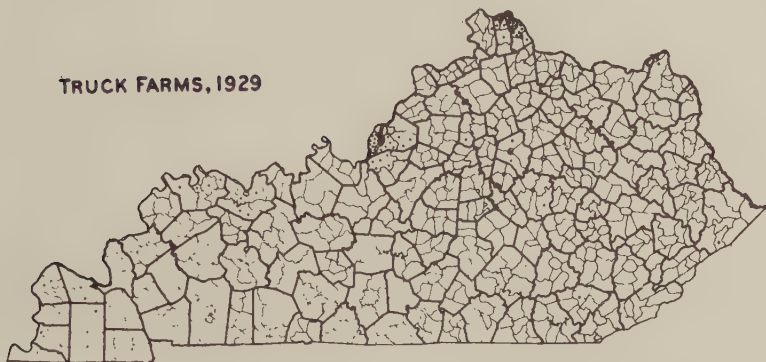
The distribution of wheat and other small grain (Figs. 11 and 12) reveals the very small area of this type of cropping, indicating that the cash grain type of farming in Kentucky is of limited importance (Fig. 17).

The stock ranch farm, a pasture-using phase of the animal-specialty type, is not very important numerically in Kentucky (Table 5). Such farms are mainly in the Bluegrass area (Fig. 18).

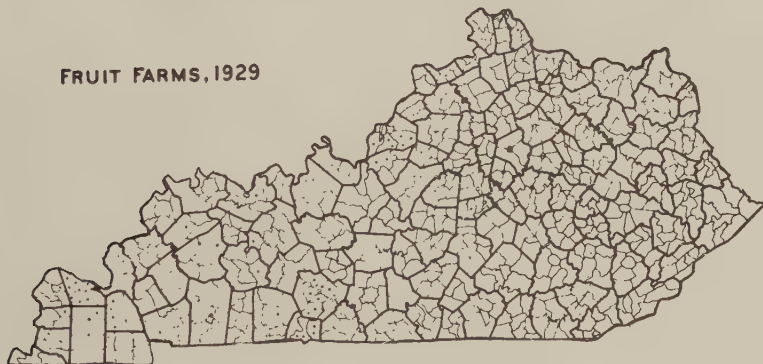
The "abnormal" type in Kentucky consists primarily of part-time farms. They are largely in the rougher areas, such as the "mountains" and the Western Coal Field, where opportunities for employment, other than farming, are offered in the coal mines and the gas and oil fields (Fig. 20). A significant number of these farms are in counties having larger cities, because these centers offer other income opportunities. The latter are usually located close to good roads.

The non-commercial type is termed self-sufficing, which means that half or more of the gross value of the products of the farm was consumed by the family. These self-sufficing farms are in the rougher and less productive areas, such as the "mountains," the Western Coal Field, and parts of the Pennyroyal

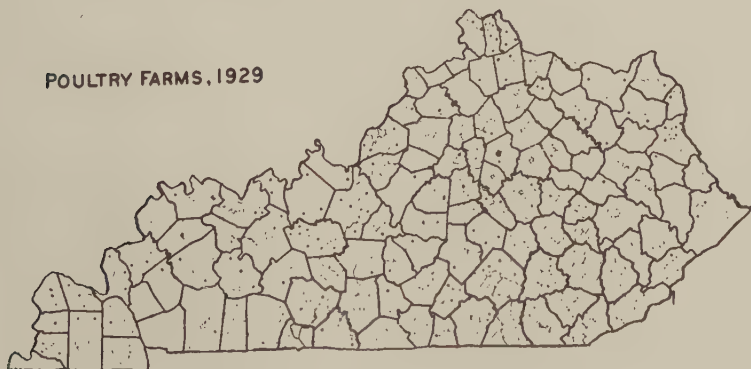
TRUCK FARMS, 1929



FRUIT FARMS, 1929

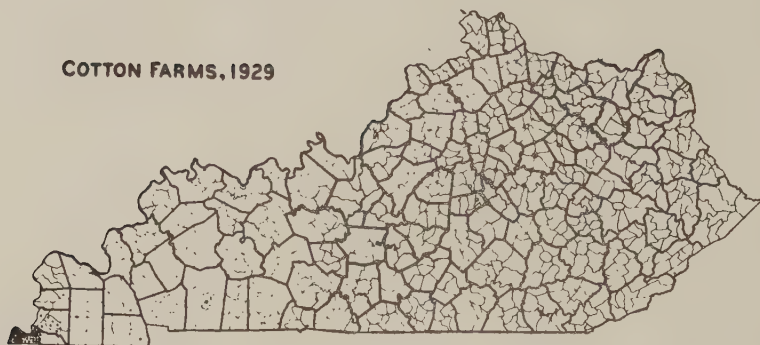
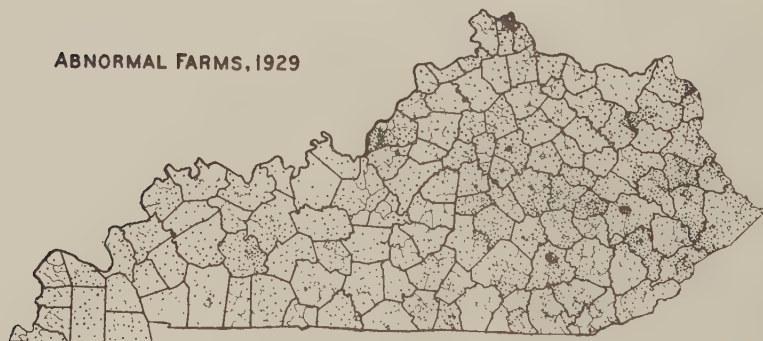


POULTRY FARMS, 1929



Each dot represents 10 farms

Fig. 19. Distribution of farms (continued).

COTTON FARMS, 1929**ABNORMAL FARMS, 1929****SELF-SUFFICING FARMS, 1929**

Each dot represents 10 farms

Fig. 20. Distribution of farms (concluded).

and Knobs (Fig. 20). The large number of them indicates their importance in the farming of Kentucky because of the number of individuals involved rather than because of the volume of their product.

TYPE-OF-FARMING AREAS

For the purpose of studying the farming of Kentucky regionally, the state was divided into eight areas in each of which the farming is recognized as having some degree of homogeneity and differing from that in adjoining areas. The location of these eight areas is shown on the frontispiece. On the page facing this are given the names of the areas with some of the characteristics of each, including the physical features of topography, soil, and climate, the economic influences involved, and other pertinent items.

In explanation it may be said that the dominance of one type is the basis for the separation of these type-of-farming areas. This does not mean that the other types are absent from the area. Neither does it mean that the entire area is uniform in its farming. What is meant is that the area is outlined to include that part of the state which tends more toward a given type than in some other direction.

The characteristics of the Bluegrass (Area 3), the Lower Ohio Valley (Area 7), the Pennyroyal Plain (Area 5), the two Coal Fields (Areas 1 and 6), and the areas of urban influence (Area 4) are clearly marked. In the Eastern Pennyroyal (Area 2) and the Purchase Region (Area 8), the degree of homogeneity is less clearly marked. Different types of farming, ranging from self-sufficing to commercial types, are found very close together because of local differences in physical characteristics. Moreover, the farms, even the commercial ones, appear to be less highly specialized than farms in other areas. For these reasons, each was designated a tobacco-general farming area. The areas cannot be thrown together into one for reasons of difference in internal farm organization, geographical separation, and historical and cultural background.

LAND USE, CROPS, LIVESTOCK, AND SOURCE OF GROSS VALUE OF PRODUCT IN KENTUCKY—1929-1930.

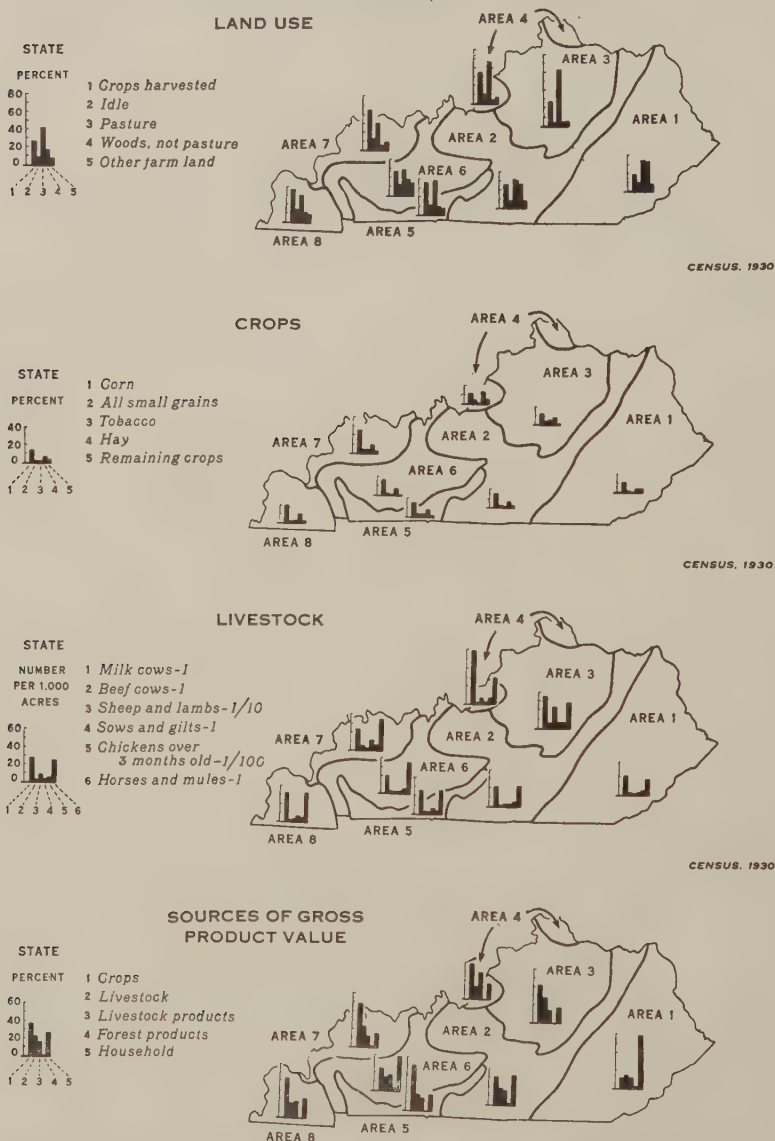


Fig. 21. Land use, crops, livestock, and source of gross value of product.

The data given in Table 6, parts of which are shown graphically in Figs. 21 to 25, reveal the significant data for the eight areas, based on the United States Census for 1930.

LAND UTILIZATION BY TYPE-OF-FARMING AREAS—1929.

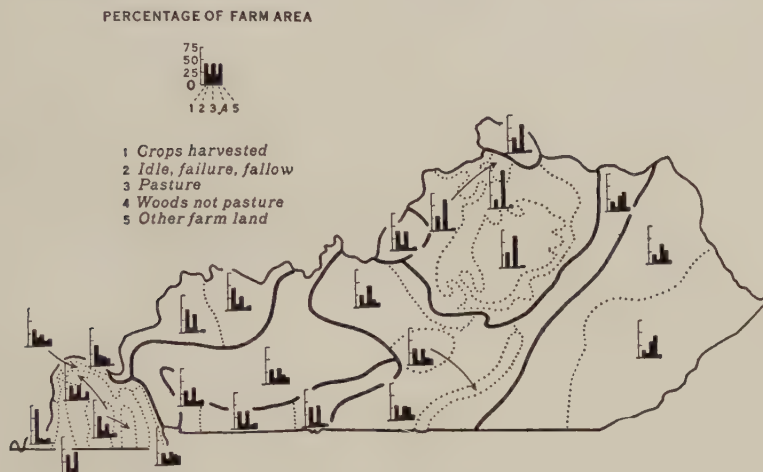


Fig. 22. Use of land, by type-of-farming areas, 1929.

CROPS BY TYPE-OF-FARMING AREAS—1929.

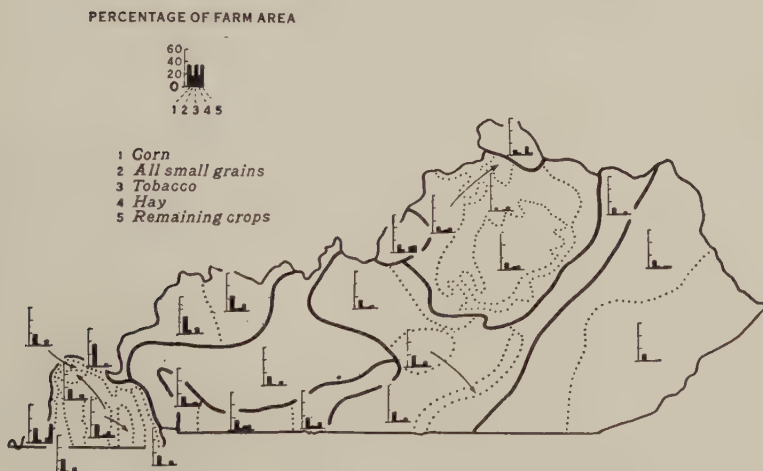


Fig. 23. Crops, by type-of-farming areas, 1929.

Table 6. Characteristics of Type-of-Farming Areas in Kentucky.¹

Item	State	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8
Percentage of State in each area	100	27	22	18	3	5	13	6	6
Percentage of each area in farm land	78	63	77	89	72	92	76	83	81
Percentage of farm land in:									
Crops harvested	27	18	26	26	34	36	27	44	36
Idle, fallow, and fallow	8	8	8	3	10	10	12	12	14
Total crop land	35	26	34	29	44	46	39	56	50
Plowable pasture	27	19	20	44	22	31	17	22	22
Woods pasture	7	10	8	6	7	4	7	3	4
Other pasture	7	5	4	12	18	3	5	5	4
Total pasture	41	34	32	62	47	38	29	30	30
Woods not pasture	17	33	26	4	3	9	18	5	11
Other farm land	7	7	8	5	6	7	14	9	9
Total farm land	100	100	100	100	100	100	100	100	100
Woods pasture	7	10	8	6	7	4	7	3	4
Woods not pasture	17	33	26	4	3	9	18	5	10
Total woods	24	43	34	10	10	13	25	8	14
Total crop land	35	26	34	29	44	46	39	56	50
Plowable pasture	27	19	20	44	22	31	17	22	22
Total tillable land	62	45	54	73	66	77	56	78	72
Corn	14	11	15	11	11	17	16	25	19
Wheat	1	2	1	2	2	2	1	3	1
Other small grain	1	1	1	1	2	2	1	1	1
Total small grain	2	1	2	3	4	4	2	4	2
Tobacco	2	2	1	4	1	4	1	4	3
Fruit, truck, potatoes	1	1	1	2	6	1	2	2	2
Legume hay	1	1	1	2	5	2	5	2	4
Non-legume hay	4	2	5	7	7	7	7	7	5
Total hay	6	3	6	7	12	8	7	9	9
Cotton	2	2	2	1	---	2	1	---	1
Remaining crops	2	2	2	1	---	2	1	2	2

Number of livestock per 1000 acres of farm land:										
Dairy cows	27	21	22	35	60	27	19	23	33	
Beef cows	3	2	2	5	2	3	2	4	2	
Other cattle	25	18	18	38	33	23	16	24	29	
All cattle	55	41	42	78	95	53	37	51	64	
Sows and gilts farrowing	4	2	2	6	3	6	2	11	6	
Other hogs	48	29	36	60	46	64	30	105	62	
All hogs	52	31	39	66	49	70	32	116	68	
Sheep and lambs	80	12	32	242	67	30	19	23	27	
Poultry	448	400	473	591	740	350	419	410	450	
Horses	12	6	10	21	20	9	10	14	13	
Mules	12	11	13	8	11	18	14	21	20	
Horses and mules	24	17	23	29	31	27	24	35	33	
Percentage of the total gross value of products:										
Crops	36	12	31	42	39	50	25	48	44	
Livestock	22	14	18	28	14	18	16	23	16	
Livestock products	15	12	16	14	30	14	17	12	18	
Forest products	1	3	2	3	2	2	3	1	2	
Household use	26	59	33	16	17	18	39	16	22	
Total	100	100	100	100	100	100	100	100	100	
Gross value of products per acre	Dollars 12	Dollars 7	Dollars 8	Dollars 13	Dollars 24	Dollars 13	Dollars 7	Dollars 13	Dollars 12	
Value of land and buildings per acre	44	24	24	0	151	43	22	51	38	

¹ From U. S. Census, 1930. Selected samples as follows: Area 1. Bell, Breathitt, Carter, Clay, Elliott, Floyd, Greenup, Harlan, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, McCreary, Magoffin, Martin, Morgan, Owsley, Perry, Pike, Whitely, and Wolfe counties. Area 2. Adair, Allen, Breckinridge, Bullitt, Casey, Clinton, Cumberland, Green, Hardin, Larue, Lewis, Meade, Menifee, Metcalfe, Monroe, Powell, Pulaski, Rowan, Russell, Taylor, and Wayne counties. Area 3. Anderson, Bath, Boone, Bourbon, Boyle, Bracken, Carroll, Clark, Fayette, Fleming, Franklin, Gallatin, Garrard, Grant, Harrison, Henry, Jessamine, Lincoln, Madison, Marion, Mason, Mercer, Montgomery, Nelson, Nicholas, Owen, Pendleton, Robertson, Scott, Shelby, Spencer, Trimble, Washington, and Woodford counties. Area 4. Campbell, Jefferson, and Kenton counties. Area 5. Magisterial districts: Barren Nos. 1, 4, 5, and 6; Caldwell Nos. 1, 4, and 6; Christian Nos. 4 and 5; Hart No. 3; Logan Nos. 2, 3, and 6; Metcalfe No. 2; Simpson Nos. 1, 2, 3, and 4; Todd Nos. 5 and 8; Trigg Nos. 2, 3, 4, 5, 6, and 7; and Warren Nos. 1, 2, 3, 4, 6, and 7. Area 6. Butler, Edmonson, Hancock, Muhlenberg, and Ohio counties. Area 7. Davies, Henderson, McLean, Union, and Webster counties. Area 8. Ballard, Calloway, Fulton, Graves, Hickman, McCracken, and Marshall counties.

LIVESTOCK NUMBERS PER 1,000 ACRES OF FARM LAND BY TYPE-OF-FARMING AREAS—1930.

NUMBER PER 1,000 ACRES OF FARM LAND



Fig. 24. Livestock per 1000 acres of farm land, by type-of-farming areas, 1930.

SOURCES OF THE GROSS VALUE OF PRODUCT IN KENTUCKY—1929.

PERCENTAGE OF TOTAL VALUE



Fig. 25. Source of gross value of product, by type-of-farming areas, 1929 U. S. Census.

AREA NO. 1. MOUNTAINS. SUBSISTENCE AREA

The eastern section of Kentucky, known as the "mountains" and having an unusually rough topography and thin soils, is very limited in its agricultural possibilities. Since practically all the products of the farm are consumed at home (Tables 6 and 7), the agriculture is described as "subsistence" in nature. The farming is limited to the production of corn and hogs, gardens, and poultry for home use. The fields are irregular and patchy and by necessity often located on very steep hillsides. This means a maximum expenditure of effort with a minimum of return. The hoe and mattock are among the most important farm tools.

Altho there is considerable "swapping" of labor, practically none is hired. Family labor is a large item in corn production, only the smallest children being exempt from work in the fields. Tenancy and the cropper labor system are usually not so common in the mountains as elsewhere but have increased considerably since 1929.

Crop yields on mountain hillsides are considered good for about three years after clearing, but in this short period much of the top soil washes away and, in order to utilize the same field for later crops, it must rest for 1 to 15 years before it can again be used for growing corn. During that resting period wild grass and bushes that spring up provide practically all the grazing available for the few livestock. Not much grass or small grain is planted on these slopes.

Hay is made mostly from the wild grasses in the patches of bottom land on the valley floor. These are cut year after year on the same land and demand little or no re-seeding. Where the valleys widen out, giving broad bottoms, corn and other crops are produced, in addition to hay. The yields on such land are good. Drainage, however, is often a problem. There is a tendency toward larger tools, more work animals, and somewhat more dairy and beef stock than is found on the distinctly hill farms. Some bottom-land farmers may even have a surplus of corn.

Ordinarily these farms have only limited opportunities for income. Little remains for sale after supplying home needs and, even if there were a surplus, the problem of economical transportation would be difficult. Markets for some agricultural products are available in the mining towns, but the lack of adequate transportation has retarded the use of this outlet. Furthermore, it has been reported that the local supplies of dairy and poultry products and of truck crops are so uncertain that merchants and commissaries have sought more regular supplies in more distant areas which have good rail or truck connections. Because of transportation difficulties, little or no tobacco is grown in this mountain area, except in those parts not too difficult of access to the Bluegrass market centers. With the advent of good roads it would be possible to develop a better marketing system for the mountain area so that surplus products could be sold.

Approximately two-thirds of the total land of Area 1 is in farms (Tables 6 and 7). In some counties no more than one-fifth is so classified. The percentage is low here partly because timber and coal companies withhold considerable land from farm use but mainly because of the rough topography. The farms are generally smaller than those of other areas. Of the farm area, approximately two-fifths is in woods, much of which is not pastured or used in any way. About one-third of the farm area is pastured, the pastures being of comparatively poor quality.

Practically all farms in the mountains produce some corn. The area grown per farm averages about 11 percent of the farm land, yielding about 20 bushels per acre. The corn produced is fed on the farms and used in the household. Little if any is sold or traded. The only other crop of importance, on an area basis, is hay, occupying 3 percent of the farm area. The hay is low in quality and mostly of the non-legume type. The area in small grain and tobacco on mountain farms is negligible.

Milk cows are kept for home use, there being little commercial production. Most farmers get a hog or two from

some other section to fatten for family use. Very few farmers have sheep, while practically all report some poultry. Compared with other parts of Kentucky, this area is of little importance in the raising of beef cattle and sheep (see Table 6).

Outside sources of income, such as lumbering and coal mining, have been of considerable importance to the mountain farmer in the past, enabling him to supplement the small income obtained from operating the farm. These industries are no longer important here, and farmers must sell or exchange such farm products as they can spare in order to obtain store goods. Very few are able to get part-time employment at "Public

Table 7. Characteristics of Farming in Area 1, Mountains, and its subdivisions (Subsistence Area).¹

Item	Area 1	Subarea 1a	Subarea 1b
	Percent	Percent	Percent
Percentage of the state in the area	27	13.5	13.5
Percentage of the area in farm land	63	58	68
Percentage of farm land in:			
Crops harvested	18	15	19
Idle, failure, and fallow	8	8	9
Total crop land	26	23	28
Plowable pasture	19	16	21
Woods pasture	10	10	11
Other pasture	5	4	7
Total pasture	34	30	39
Woods not pasture	33	42	26
Other farm land	7	5	7
Total farm land	100	100	100
Woods pasture	10	10	11
Woods not pasture	33	42	26
Total woods	43	52	37
Total crop land	26	23	28
Plowable pasture	19	16	21
Total tillable land	45	39	49
Corn	11	11	11
Wheat	3	2	3
Other small grain	1	1	2
Total small grain	1	1	2
Tobacco	2	2	2
Fruit, truck, potatoes	1	1	1
Legume hay	1	2	2
Non-legume hay	2	1	3
Total hay	3	1	3
Remaining crops	2	1	2

Table 7. Characteristics of Farming in Area 1, Mountains, and its subdivisions¹ (concluded).

Item	Area 1	Subarea 1b	Subarea 1a
	Number	Number	Number
Number of livestock per 1000 acres of farm land:			
Dairy cows _____	21	18	22
Beef cows _____	2	1	2
Other cattle _____	18	16	21
All cattle _____	41	35	45
Sows and gilts farrowing _____	2	3	2
Other hogs _____	29	38	20
All hogs _____	31	41	22
Sheep and lambs _____	12	12	12
Poultry _____	400	370	430
Horses _____	6	5	8
Mules _____	11	11	11
Horses and mules _____	17	16	19
	Percent	Percent	Percent
Percentage of the total gross value of products:			
Crops _____	12	9	16
Livestock _____	14	11	17
Livestock products _____	12	9	15
Forest products _____	3	4	2
Household use _____	59	67	50
Total _____	100	100	100
	Dollars	Dollars	Dollars
Gross value of products per acre _____	7.15	7.10	7.20
Value of land and buildings per acre _____	24.00	25.00	24.00

¹ From U. S. Census, 1930. Selected samples as follows: Area 1 as in footnote 1, Table 6. Subarea 1a.—Bell, Breathitt, Clay, Floyd, Harlan, Knott, Knox, Leslie, Letcher, Martin, Owsley, Perry and Pike counties. Sub-area 1b.—Boyd, Carter, Elliott, Greenup, Jackson, Johnson, Laurel, Lee, McCreary, Lawrence, Magoffin, Morgan, Whitley and Wolfe counties.

² Less than half of one percent.

Works,"⁷ because of the competition of large numbers of regular laborers now unemployed and because of the small amount of such work available. The combined effect of these various influences results in a gross value of products per acre only a little more than half the state average. Of this gross amount, almost two-thirds is consumed on the farm, while forest products, livestock, and livestock products account for the remainder. As is to be expected, land values are low.

⁷ The term "Public Works" in the Kentucky mountains includes road work (county or state highway), work in mines, railroad employment, etc.

Altho what has been said above applies in general to the entire area shown on the map (Frontispiece) as the Mountain Area, it must be pointed out that there are at least two noticeable differences in the agriculture within the area itself. The type of farming found in the southeastern portion is distinguished from that in the western and northern parts by the fact that in the southeast both the valleys and ridges are narrow; this, with the steep hillsides, gives a "V" shaped landscape. In the western and northern sections the farms are characterized as "ridge top" (1-b) in contrast to "creek bot-

Table 8. Characteristics of Farming in Area 2, Eastern Pennyroyal and Knobs, and its subdivisions (General Farming Area).¹

Item	Area 2	Subarea 2a	Subarea 2b	Subarea 2c	Subarea 2d
	Percent	Percent	Percent	Percent	Percent
Percentage of state in the area	22	8.2	2.7	6.0	5.5
Percentage of the area in farm land	77	75	84	79	82
Percentage of farm land in:					
Crops harvested	26	18	33	30	25
Idle, failure, and fallow	8	7	9	9	7
Total crop land	34	25	42	39	32
Plowable pasture	20	14	24	16	33
Woods pasture	8	12	5	7	6
Other pasture	4	4	3	4	5
Total pasture	32	30	32	27	44
Woods not pasture	26	39	15	25	15
Other farm land	8	6	11	9	9
Total farm land	100	100	100	100	100
Woods pasture	8	12	5	7	6
Woods not pasture	26	39	15	25	15
Total woods	34	51	20	32	21
Total crop land	34	25	42	39	32
Plowable pasture	20	14	24	16	33
Total tillable land	54	39	66	55	65
Corn	15	11	19	18	15
Wheat	1	1	1	1	1
Other small grain	1	1	1	1	1
Total small grain	2	1	2	2	2
Tobacco	1	1	3	2	2
Fruit, truck, potatoes	2	2	2	2	2
Legume hay	1	1	2	1	1
Non-legume hay	5	4	7	6	4
Total hay	6	5	9	7	5
Cotton	2	2	—	—	—
Remaining crops	2	—	—	1	1

Table 8. Characteristics of Farming in Area 2, Eastern Pennyroyal and Knobs, and its subdivisions¹ (concluded).

Item	Area 2	Subarea 2a	Subarea 2b	Subarea 2c	Subarea 2d
	Number	Number	Number	Number	Number
Number of livestock per 1000 acres of farm land:					
Dairy cows	22	18	30	21	25
Beef cows	2	2	2	1	3
Other cattle	18	15	23	16	21
All cattle	42	35	55	38	49
Sows, gilts, farrowing	3	2	3	4	4
Other hogs	36	24	41	38	39
All hogs	—	26	44	42	43
Sheep and lambs	32	16	22	34	55
Poultry	473	396	584	465	430
Horses	10	7	11	10	12
Mules	13	9	17	15	11
Horses and mules	23	16	28	25	23
	Percent	Percent	Percent	Percent	Percent
Percentage of the total gross value of products:					
Crops	31	22	44	34	30
Livestock	18	22	14	14	25
Livestock products	16	15	13	14	18
Forest products	2	4	1	3	2
Household use	33	37	28	35	25
Total	100	100	100	100	100
	Dollars	Dollars	Dollars	Dollars	Dollars
Gross value of products per acre	8.10	6.40	11.60	8.90	7.80
Value of land and buildings per acre	24.00	20.00	32.00	32.00	25.00

¹ From U. S. Census, 1930. Selected samples as follows: **Area 2.** As in footnote 1, Table 6. Subarea 2a. Clinton, Lewis, Menfee, Powell, Rowan, and Wayne counties. Subarea 2b. Green and Taylor counties. Subarea 2c. Adair, Allen, Casey, Metcalfe, and Monroe counties. Subarea 2d. Breckinridge, Hardin, Larue and Meade counties.

² Less than half of one percent.

tom" (1-a) in the southeast. In the former the ridges are broader and more rounded, and the general terrain is somewhat less rough in character.

The farms in Subarea 1-b are larger than those in Subarea 1-a, and a smaller proportion of the farm area is in woods, which permits more pasture and crop land (Table 7). This additional land is planted in hay and small grain, the same proportion of farm land being in corn in both subareas. Tobacco

and legume hay are slightly more important in Subarea 1-b than in the rougher section.

Cattle, especially beef, are more numerous in the northwest subarea, but the proportion of hogs is larger in the southeast section than in the northwest. The numbers of sheep and poultry do not differ greatly.

The gross productivity per acre is slightly higher in 1-b, and the farming is more commercial in character, the proportion of the products consumed on the farm representing a smaller share of the total. The proportion of income from crops, livestock, and livestock products is correspondingly higher in 1-b. Farm land values, however, appear to be slightly higher in 1-a.

Farming in the mountains has varied considerably in the past eighty years. The amount of land in farms was smaller in 1930 than at any time since the Civil War and has been declining steadily since 1890 when 80 percent of the total land area was classified as farm land. The acreage in pasture, hay, tobacco, and potatoes was higher for 1929 than for any previous census year, but the acreage in small grain and corn was below previous figures. The decline in corn acreage was not marked, but wheat acreage dropped from 73,000 in 1899 to 750 in 1929.

Shifts have also occurred in livestock. Altho the number of milk cows in 1930 was considerably below that in 1920, it was more than double that of 1860. Sheep have declined steadily since 1870, and the present number is one-third of the earlier figure. The trend of hogs has not been consistent, varying first upward then downward, but the number for 1930 was smaller than any figure since 1840 and only one-third of that for 1900.

AREA NO. 2. EASTERN PENNYROYAL AND KNOBS. GENERAL-FARMING AREA

The farming here is a mixture of several types and, therefore, is called general. The principal crops produced for sale are tobacco and some wheat and corn. Dairy and poultry products, together with some hogs, sheep, and beef, are the livestock items. The area is largely given to commercial farming but at

the same time includes elements of a subsistence nature. Rough topography and only moderately good soils give the southeastern part of the area low productivity. The northwestern part has a better topography and is used to a larger extent for pasture. The productivity here also is low.

Three-fourths of the total land is in farms and over half of this is classed as tillable (Tables 6 and 8). Corn is the major crop in terms of area and, with hay, leaves only a small portion of the harvested crop land for small grain and tobacco. Dairying is more important as a livestock enterprise than sheep, swine, or beef. Poultry contributes considerably to the farm income. The presence of a number of items in the farm income, none of which is outstandingly important, characterizes this as a general-farming area.

This section includes a large portion of central Kentucky, much of it falling within the geological unit known as the Mississippian Plateau or the Pennyroyal. The "Knobs" form the northern boundary of the area, extending from the Eastern Coal Field to the outlying formation of the Western Coal Field, south to the state line, and bounding Area 5 on the southwest. Included are some diverse elements, ranging from fairly smooth topography on interstream divides and the wider bottoms to rough topography where the general level has been dissected by the streams which have cut deeply into the surface. Some of the northwestern portion, underlain by the Mississippian Mammoth Cave limestone, presents a sink surface; that is, the drainage waters instead of flowing over the surface in a well-developed stream pattern sink into the limestones below and flow away in underground channels. Some of these sinks are small and do not interfere with the farming. Others are deep, have abrupt sides, and are, therefore, not only an obstruction to farming with machine tools but may actually be dangerous for livestock. The southeastern portion is severely eroded, the drainage waters having cut thru the Mammoth Cave limestone and down into the underlying Waverly sandstones and shales. This is because of the position of this area on the crest of the uplift which centers in the Jessamine Dome in central Kentucky and has

made it possible for erosion to cut down farther into the geological structure here than either to the east or west. The sandstones and shales of the Waverly formation give rise to an abrupt topography which severely limits machine cultivation.

The soils of the Mammoth Cave limestone are generally good, their characteristic red color and cherty nature being associated with fair to good productivity, but the slopes are inclined to wash and gully. Some of this land is cropped too much for best results; it would be a more effective use of the land if it were put in pasture, as in Hardin county. The soils of the Waverly sandstones and shales are poor to very poor, particularly where associated with steep slopes, a condition likely to prevail in this geological formation because of the shaley structure and the thin-bedded character. Some limestones appear in the Waverly formation, and the few good areas of the Waverly are explained by the influence of these in the formation of the better topography and the better soils (Figures 5 and 6).

The network of good auto highways in Area 2 is increasing, and the market outlets for livestock, livestock products, and tobacco are becoming accessible to many farmers of the rougher parts. A portion of this area in the southern part of the state is tributary to Nashville, some of the poultry and dairy products being drawn in that direction, while some of the tobacco also goes to Tennessee market centers. The larger part of the tobacco is marketed in a few cities in the area, such as Greensburg, or in nearby towns, such as Lebanon, Danville, and Richmond, which lie on the edge of the Bluegrass; it may even be sent to central Bluegrass cities. Tobacco is now trucked to market for the most part, only the farmers close to market using team and wagon haulage. Outlying areas and farms on poor roads use wagons to haul the tobacco to the main highway where it is transferred to trucks which then proceed to market.

The sales of livestock products, tho not great for any one farm, are considerable in the aggregate. Well-organized "pick up" systems have been developed by the centralized butter manufacturers of Louisville, the Bluegrass cities, and the Nashville

area, where motor trucks collect the cream assembled at the local cream stations. Some cream is sent direct by the farmer by rail. Access to good roads offers some farmers an opportunity to sell whole milk to the city, as market milk. Farmers on less favorable roads tend to sell cream. Some of the milk-selling farms located on poor roads, which are good only part of the year, turn to cream selling in the season of bad roads.

The use of land in this area shows great diversity, major differences appearing between the various minor civil divisions within many counties, depending mainly upon whether or not the topography is favorable. The proportion of tillable land is usually higher where the topography is smoother.

The land use, whether for crops or pasture, is of a mixed character. There are not only different proportions in crops harvested but also different proportions in crops and pasture and different ratios of crops to pasture. For much of the state the proportion of the farm land devoted to pasture exceeds the proportion used for crops. Here, however, the proportion in crops harvested exceeds that in pasture in some instances. Altho the return from the land used for crops may be low, the return from that used as pasture is probably lower still. Of the farm land, not much is reported in woods pasture in most of the counties. With such a small proportion of the farm land in productive use, low productivity is to be expected.

Corn occupies most of the land in harvested crops, its area being larger than that of all other crops put together, in most counties in Area 2. The proportion of the farm area devoted to hay equals the average for the state. Analysis shows that practically all of this hay is the grass or wild type, again emphasizing low soil productivity.

The number of dairy cows is scarcely larger than the number necessary to supply the needs of the home. This class of livestock does assume more commercial importance in parts of Area 2, however, as will be shown later. The number of sows and gilts farrowing is not large, but, in localities where corn production warrants, some emphasis is given to this enterprise. Nowhere do sheep and lambs assume a position of any great

significance, with the possible exception of the pasture-producing areas in the northwest, but their number is smaller here than in the important sheep-producing sections of the state.

In total productivity this area is only slightly superior to Area 1. The gross value of products per acre is eight dollars, in comparison with seven dollars for Area 1 and twelve for the state as a whole. Of this, approximately one-third is from crops, one-third from livestock and livestock products, and the remaining third from products for household use.

As is true of other type-of-farming areas in Kentucky, it is possible in Area 2 to point out sectional differences which are significant in presenting a picture of the farming. Subarea 2-a, bordering the Mountain Area to the east and including the Knobs on the north, presents topographic conditions which are less suited to agriculture than those of other parts of the area. This explains the low percentage of tillable farm land and land in harvested crops. The type of farming in Subarea 2-a resembles that of Area 1, with the notable exception that there is more emphasis on commercial aspects of agriculture and less emphasis on agriculture of a subsistence nature in 2-a than in Area 1. This is brought about by the greater sale of cash crops, notably tobacco, and somewhat greater importance of livestock and livestock products.

Subarea 2-b takes on the characteristics of a commercial type of agriculture to a greater degree than is exhibited in the other subareas. The proportion of the farm land in harvested crops here is nearly twice that in Subarea 2-a. These harvested crops include more tobacco, small grains, and hay. In combination with these, dairy cows, hogs, and poultry are considerably more important. The combination of these enterprises results in a gross value of products per acre which is nearly double the figure for Subarea 2-a, crops accounting for more than either livestock and livestock products or household-use items. A larger percentage of the farm land is in crops harvested than in pasture, altho the difference is slight. This situation is unusual for most sections of Kentucky and bears out the statement of the adaptability of the soil and topography in Subarea 2-b to a

crop system of farming in contrast to pasture. The land in this area lies well, is fairly well drained, and is generally more productive than that in 2-a.

The farming in Subarea 2-c is of a type intermediate between the two just discussed. This is true for practically all items of farm organization, resulting in a gross value of products which is lower than that of Subarea 2-b but higher than that of 2-a. Likewise, the source of this gross value indicates that farms of a subsistence nature are more important here than in Subarea 2-b but not quite so important as in Subarea 2-a. Topography and soil, being intermediate in character, are evidently responsible for these results.

Of the four Subareas, 2-d would be classified as a livestock section. Altho the proportion of dairy cows in 2-d is not so great as in 2-b, there are more beef cows and considerably more sheep. Nearly twice as much land is devoted to pasture crops as to harvested crops. Enough corn is grown, however, to support a relatively large hog production, so that livestock account for 43 percent of the gross value of products. Household-use products are of less importance, and the gross value of products per acre is low because of the extensive type of farming followed.

Examination of historical data for Area 2 indicates that changes in number of livestock and crop acreage in this section of Kentucky correspond with the trends for the state as a whole.

AREA NO. 3. BLUEGRASS. LIVESTOCK-TOBACCO AREA

A livestock-tobacco type of farming prevails in the area in north central Kentucky known as the Bluegrass. Productive soils and a relatively favorable topography contribute to a high degree of land use for agriculture. From one-half to three-fourths of the farm land is in pasture. Most of this pasture is bluegrass. The principal crops produced for sale are tobacco, wheat, bluegrass seed, and corn; the principal livestock are dairy and beef cattle, sheep, hogs, and poultry. In a part of the area the production and sale of the Thoroughbred, Standard Bred and the Saddle Horse is important. The area nearly coincides with the bluegrass area described under Topography.

The farming here is an example of an intensive-extensive type, with tobacco the intensive enterprise, the pasture-feed-crops-livestock combination being more extensive. The presence of many large farms is an expression of the high physical and economic productivity made possible by the favorable topography and fertile soil in an environment of suitable climate and satisfactory market outlets. Machine operation of large fields, producing ample yields, offers an inducement for men with means to buy large areas for farms. This situation has prevailed from the beginning, for shortly after the settlement in 1774 the slave economy made its appearance here (Fig. 1).

The high physical productivity of the bluegrass pastures which distinguish the type of farming here is traceable to the character of the soil derived from the phosphatic limestone underlying the area. The comparative advantage of the bluegrass is traceable to its high value as a livestock feed and the complementary and supplementary relation which it bears to the intensive tobacco enterprise. Bluegrass also contributes to a better quality of burley tobacco. It is an excellent soil builder, and, when a well developed sod of five years or more is turned under for tobacco, the accumulation of plant food, humus, and organic matter provides soil conditions for superior tobacco production.

Because of its intensive character, tobacco fits well in a supplementary and complementary sense with the more extensive pasture, feed crops, and associated livestock enterprises. Corn and hay are grown on these farms as feed. Small grains seeded in the fall furnish additional pasture for livestock and incidentally act as a cover crop to reduce erosion in the winter and early spring. Wheat, barley, and rye are reported by only a small number of farmers in comparison with the number reporting corn or tobacco; oats is reported by a still smaller number. Wheat is usually a cash crop, the oats and barley are livestock feeds, while rye is seldom allowed to mature but is

usually pastured or plowed under. The small grains generally serve as a nurse crop for the grass seeding.

Bluegrass sod is usually broken for tobacco or corn. This is followed by a small grain as cover or nurse crop. Hay or pasture follows, to be seeded in turn to bluegrass. In the typical cropping system of the Bluegrass the length of the rotation is seldom shorter than eight years. As a rule, the rotations are shorter on the small and longer on the large farms. Tobacco or corn may appear on the same land two years instead of one, although corn usually is produced only to the extent necessary to supply the farms' needs.

Operators of large farms which have much livestock at times prefer to buy some corn for their cattle and hogs instead of attempting to produce the entire supply. The small acreage of corn on some farms is traceable to shallow soil, the bed rock often being close to the surface. Such land, obviously, is better used as pasture. Erosion is minimized in this manner, and yields are kept at a favorable level. The yields of crops in this area are well above the average for the state.

Differences in the relationship of tobacco and bluegrass are found in the combination of dairying and sheep with bluegrass and tobacco on the smaller farms, while beef cattle and sheep are combined with bluegrass and tobacco on the large farms. The smaller farms usually have more tobacco and corn, relative to the area in bluegrass, than the larger farms. The large farms tend to have less tobacco and corn but some wheat or other small grain. Size accounts for the more intensive character of the small farms and the extensive character of the large farms.

The Bluegrass Area is favorably located with reference to markets, Lexington having the largest tobacco market in the world. Other tobacco markets, tho smaller, are conveniently located in cities within the area. Livestock markets just outside the territory, in Louisville and Cincinnati, draw large shipments from the Bluegrass, and local livestock yards are well distributed. At present, cooperative marketing is not widely used, altho a wool pool and a bluegrass seed cooperative are

doing a substantial business. Local markets for dairy, truck, and poultry products are open to nearby farms, and in a few localities the location of a cheese factory or condensary has stimulated the production of dairy products beyond local needs. Wheat is marketed mainly at local mills. The Bluegrass Area is served by a network of all-weather roads, and an extensive railway service makes the transportation of its products easy.

The tobacco crop occupies only a small part of the farm area (Table 9), hay about twice as much, and corn approximately as much as tobacco and hay together. The area in pasture occupies approximately three times the area in tobacco, hay, and corn. The other crop enterprises, including wheat, oats, barley, and rye, occupy relatively small proportions of the farm area. Altho the farms in the area usually are large, the absolute acreage of tobacco per farm is small. This crop, however, represents a large enterprise because of the heavy labor demands, particularly at the time of cutting and housing. This demand for labor is supplied in large part, by share tenants and croppers. Many croppers are engaged to produce tobacco and little or nothing else on the farm. Often the owner-operator grows no tobacco himself, preferring to let the crop to croppers or tenants on a share basis.

The relative importance of the livestock enterprises is shown in Table 9. Dairy cows are far more numerous than strictly beef cows. Sheep are still more numerous, especially in certain counties. The number of sows and gilts farrowing is one of the highest figures in the state, but since this is not an important corn producing area, a large proportion of the hogs are sold as shoats or feeder pigs rather than as fat hogs. These move into the corn belt states or into the hands of local farmers for "meat hogs." The management of the beef and sheep enterprises in the Bluegrass emphasizes grazing as a source of animal feed. Very little grain feeding of lambs is done, and grass makes up a much larger proportion of the total feed for beef animals than would be expected in an area such as the corn belt.

Value of land and buildings per acre and gross values of

products per acre are higher in Area 3 than in any other section of Kentucky, with the exception of the relatively small districts of urban influence. Farm income is derived mainly from tobacco, livestock and livestock products, wheat, and bluegrass seed.

Further evidence of the commercial character of the farming in this area is to be noted in the relatively unimportant position of production for the household (Table 9).

Table 9. Characteristics of Farming in Area 3, Bluegrass, and its subdivisions (Livestock-Tobacco Area).¹

Item	Area 3	Subarea 3a	Subarea 3b	Subarea 3c
	Percent	Percent	Percent	Percent
Percentage of state in the area	18	6.0	6.2	6.0
Percentage of the area in farm land	89	89	88	93
Percentage of farm land in:				
Crops harvested	26	29	18	30
Idle, failure, and fallow	3	2	1	1
Total crop land	29	31	19	31
Plowable pasture	44	48	41	44
Woods pasture	6	8	14	2
Other pasture	12	7	19	3
Total pasture	62	63	74	64
Woods not pasture	4	1	2	1
Other farm land	5	5	5	4
Total farm land	100	100	100	100
Woods pasture	6	8	14	2
Woods not pasture	4	1	2	1
Total woods	10	9	16	3
Total crop land	29	31	19	31
Plowable pasture	44	48	41	59
Total tillable land	73	79	60	90
Corn	11	11	6	12
Wheat	2	2	3	4
Other small grain	1	2	1	1
Total small grain	3	4	1	5
Tobacco	4	5	3	6
Fruit, truck, potatoes	2	2	2	2
Legume hay	2	3	2	3
Non-legume hay	5	6	5	4
Total hay	7	9	7	7
Cotton	—	—	—	—
Remaining crops	1	1	1	1

¹ From U. S. Census, 1930. Selected samples as follows: Area 3. As in footnote 1, Table 6. Subarea 3a. Henry, Mason, Shelby, and Trimble counties. Subarea 3b. Owen. Subarea 3c. Bourbon, Fayette, Jessamine, and Woodford counties.

² Less than half of one percent.

Table 9. Characteristics of Farming in Area 3, Bluegrass, and its subdivisions (Livestock-Tobacco Area)¹ (concluded).

Item	Area 3	Subarea 3a	Subarea 3b	Subarea 3c
	Number	Number	Number	Number
Numbers of livestock per 1000 acres of farm land:				
Dairy cows	35	44	27	31
Beef cows	5	4	3	8
Other cattle	38	35	23	52
All cattle	78	83	53	91
Sows and gilts farrowing	6	7	2	9
Other hogs	60	71	21	94
All hogs	66	78	23	103
Sheep and lambs	242	124	420	373
Poultry	591	547	376	555
Horses	21	22	19	29
Mules	8	7	3	10
Horses and mules	29	29	22	39
	Percent	Percent	Percent	Percent
Percentage of the total gross value of products:				
Crops	42	44	37	45
Livestock	28	19	24	39
Livestock products	14	20	14	8
Forest products	2	2	2	2
Household use	16	17	25	8
Total	100	100	100	100
	Dollars	Dollars	Dollars	Dollars
Gross value of products per acre	18.00	17.50	11.80	34.00
Value of land and buildings per acre	80.00	90.00	47.00	176.00

Any discussion of the type of farming in the Bluegrass Area must recognize three distinct subdivisions brought about by differences in topography and soil, traceable to geological outcrops. These are described as the Inner Bluegrass (Subarea 3-c), enclosed by the Intermediate Bluegrass (Subarea 3-b), which in turn is almost completely surrounded by the Outer Bluegrass (Subarea 3-a), extending to and enclosed by the Knobs formation.

The Inner Bluegrass (Subarea 3-c). The topography of this area is gently rolling. The soils, derived from highly phosphatic limestones, are of higher fertility and of sufficient depth

for a successful agriculture. Most of the farms are large, many embracing several hundred acres, crop yields are high, and there is very little waste land. The land commands high prices, and most farms support substantial residences. From one to several cropper or share tenants, whose principal interest is tobacco, supply much of the labor. Even the tenants are able to maintain a fairly high standard of living. It is in this area that most of the race-horse farms are located. Horse farms, however, occupy only a few of the larger tracts, and their economic importance is limited as compared with that of the more usual type of agriculture. In many ways this is one of the most desirable farming areas in the United States.

The Inner Bluegrass is distinguished from the other Bluegrass areas by the fact that here the farms are generally larger, yields are higher, a larger acreage of tobacco is grown relative to the total land in farms, and there are more hogs and beef animals absolutely and relatively and a greater acreage of small grain. Land values are considerably higher, the farm buildings are much more pretentious, and less land is unsuitable for agricultural use here than in the other two areas (Table 9).

The Intermediate Bluegrass (Subarea 3-b). This area is characterized by considerable rough, steep land. The soil, derived largely from calcareous shales, is the least productive of the three subareas and washes badly on the slopes when in cultivation. Farms are generally small, and the buildings are unpretentious except on the broad river bottoms. Decidedly less emphasis is placed on cropping than on livestock systems, but the intensive-extensive, tobacco-pasture type of farming prevails here, altho there is less emphasis on tobacco.

Land here is the least valuable, there are fewer tenants, and farm buildings are the poorest as compared with the other two areas. Somewhat less attention is given to dairying here but considerably more to sheep than in the Inner Subarea. A much greater proportion of the land here is unsuitable for crop use than in the other subareas, hence the large percentage in pasture. This is distinctly an inferior area, relative to the other

two Bluegrass subareas, and there is a greater tendency toward farms of a subsistence type (Table 9).

The Outer Bluegrass (Subarea 3-a). Altho the soils of this area were derived from limestone formations and are of good depth, they do not equal those of the Inner Bluegrass; they are much superior, however, to those of the Intermediate Bluegrass Area in fertility. The topography is such that cultivation of a large percent of the land is possible. Altho large estates are fewer in number, the type of agriculture closely approaches that of the Inner Subarea. There is not so much waste land in the Outer Subarea as in the Intermediate, altho the proportion is greater than in the Inner. Dairying is perhaps relatively more important in this Outer section than in the other Bluegrass subareas (Table 9).

The crop and livestock relationships in the Bluegrass have varied somewhat in the past yet not so much as in other areas in Kentucky.

Altho the acreage in farms, improved land, and land in harvested crops increased up to 1910 and then declined sharply, for Kentucky as a whole (Fig. 2), these figures for the Bluegrass showed only slight variation and for the most part have changed but little thruout the period. As was true for the rest of the state, the acreage in small grains has been on the decline in the Bluegrass counties, but this has not been replaced by hay to the degree noted for the state as a whole. Contrary to figures for other areas, the acreage in corn has tended downward in the Bluegrass and tobacco has exhibited a far greater increase here than in other areas. This is explained by its late development into an important crop in the Inner Area. Hemp, never of very great importance on an acreage basis, has entirely disappeared.

Changes in the number of livestock during the past 80 years, in the Bluegrass, conform, for the most part, to the trend for the state; the number of sheep, however, has increased much more rapidly in the Bluegrass than elsewhere. Much of this increase has taken place in the Intermediate Bluegrass (1-b),

with a correspondingly large decrease in crops, especially small grain and corn, and some increase in the acreage in hay in the same area. Dairy cattle have increased more rapidly in the Outer Bluegrass counties than in either of the other two sub-areas, because some of the counties are adjacent to large cities and because the land is not especially suited to the intensive-extensive character of the farming of the Inner Subarea.

AREA NO. 4. URBAN-INFLUENCE AREAS

The types of farming in the several areas in which urban influence has affected the agriculture are those in which the cities' demands for perishables and semi-perishables have induced a high degree of specialization in the agriculture. These types include truck farms, orchards, poultry farms, and dairy farms, as well as combinations of these. Every city, no matter how small, affects the agriculture adjacent to it in some degree. This is particularly noticeable along the lines of the main highways where the agriculture has a very different character from that of the side or back roads.

The areas of urban influence on the types of farming in Kentucky, are, first of all, the areas tributary to the larger river cities, as Cincinnati and Covington, Louisville, Paducah, Ashland, Owensboro, and Henderson; and, second, the areas tributary to the inland cities of some size, as Lexington, Bowling Green, Frankfort, and Hopkinsville. The river cities are generally located at a major bend in the stream, where the water turning against the bank tends to maintain its position without shifting, thus giving the city a permanent character. The inland cities are the result of various forces, a railroad often helping to build a city where formerly only a town existed or increasing the population of a large city. In other cases the city is the natural product of an important commercial area. Thus Lexington is the natural center of the fertile Bluegrass, while Hopkinsville and Bowling Green are important commercial cities of the Pennyroyal Plain.

The physical character of each urban-influence type-of-

farming area partakes of the major type-of-farming area in which the more specialized area falls. Thus the area near Louisville is in part bottom land lying south and southwest of the city; in part upland, of the Silurian and Devonian formations, adjacent to the Bluegrass, lying well as to topography but only fair as to soils; while the remainder is rough, knob-like land that is not farmed much in an intensive way. Poor soil limits the type of farming, altho, if the urban influence is sufficiently great, land with adverse topography and poor soil will be used for agriculture, especially if the available area of better soil and more favorable topography is limited. Thus some of the poor soils adjacent to Louisville have been improved by farmers because it paid to do so.

The area, tributary to Cincinnati, Ohio, and Covington and Newport in Kentucky, is composed partly of a narrow belt of bottom land along the Ohio and Licking rivers but much more of rough land adjacent to the outer Bluegrass upland of the major Bluegrass area. Back from the river the terrain is the upland proper, and, tho some of the specialized farming extends into this upland, the specialized character is soon lost, distance from the city forcing the farming into the type of the more extensive area nearby. However, it is to be observed that most of the very rough land nearest the city is not farmed as much as the better land farther out. This very rough land is often used for pasture or is idle.

Market outlets are obviously the primary reason for the location of these areas. The effect of the urban market is to raise the price of specialties, such as truck, fruit, poultry, and dairy products, because of the cost of transporting the amounts needed for the city, over and above what ordinary production in the area can and will bring forth. Thus producers are encouraged to enter these lines because these urban outlets, thru this price situation, usually offer sufficient inducement for some of them to leave their ordinary types for the more specialized types. Marketing is further facilitated by the good roads, areas with poor roads, even tho nearby, falling behind those with

favorable roads, since the regular and speedy marketing of perishables or semi-perishables is of vital importance.

The land-use program in these areas where the types of farming have been affected by urban influences is not easily read from the figures obtainable for the political areas according to which these data are given in the census. The presence of an all-weather road, for instance, is a vital factor in drawing the urban-influence type of farming away from the city across the political boundaries of the areas, thus leaving the nearer areas relatively untouched.

Altho the types of farming in the two areas of urban influence, considered of sufficient importance to be shown on the map, have certain similar characteristics, their differences are sufficient to warrant their description separately.

Cincinnati (Subarea 4-a). The percentage of land in farms in Subarea 4-a is below that of the adjacent Bluegrass area. This is undoubtedly the result of the presence of a strong urban demand for land. Of the land in farms, less than one-third is in crops harvested. This is a lower figure than would be expected normally but it is explained by the presence of considerable rough land which in turn accounts for the large percentage in pasture. That there is considerable rough land is further borne out by the fact that two-thirds of the land in farms is considered tillable, yet less than half of this appears in harvested crops, indicating that farmers have found a minimum of cropping to be the best practice. This is to be seen also in the acreage of harvested crops, indicating that the percentage of farm land in corn is only slightly more than half the percentage of crop land in all hay. Further examination of these crop figures shows that the acreage of intertilled crops is kept at a minimum. Even the acreage in fruit, truck, and potatoes, tho large, is only half the percentage of farm land in similar crops in Subarea 4-b. Altho tobacco is relatively unimportant in both areas, it is somewhat more important in 4-a.

There are approximately 100 cattle per 1,000 acres of land in 4-a, two-thirds of which are dairy cows. There is a surprisingly large number of sheep and lambs and a minimum of hogs.

This combination of livestock is well adjusted to the land-use system just presented and further bears out the statement, made previously, that the character of the farming adjacent to cities partakes of the type of farming followed in surrounding districts but adjusts itself to the demands of the city market.

The farms in the Cincinnati area are smaller than those near Louisville. The gross value of products per acre is \$21. A smaller proportion of this comes from crops and a larger proportion from livestock in 4-a than in 4-b, and more emphasis is placed on items produced on the farm for household use in the former. The value of land per acre in 4-a is only slightly more than one-half the value per acre in 4-b.

Louisville (Subarea 4-b). The percentage of land area in farms here is very low as compared with that of adjacent areas, due to the strong demands for land for other uses. A larger percentage of farm land is in crops harvested than in pasture. The areas in fruit, truck, and potatoes are large in comparison with those in other parts of Kentucky. The production of potatoes goes beyond local demands, and a large share is shipped into other parts of the United States. A favorable topography and the large size of farms accounts for the growing of some wheat. This crop works in well on farms where potatoes are grown.

As to livestock, the proportion of dairy cattle is slightly below the figures for Subarea 4-a, tho there are probably more dairy farms of a specialized type in 4-b. Sheep are less important and hogs more important. Since farming in Subarea 4-b is considerably more intensive than in 4-a, it is not surprising that the gross value of products per acre is approximately one-third higher. Almost half of this is from crops, while a minimum is represented by products for use in the household (Table 10).

In contrast with similar figures for the state as a whole, the total area of land in farms has been declining since 1880, in Area 4, altho steadily on the increase until that date. This increase in farm land area was evidently arrested by urban expansion, so that the total land area in farms at present is scarcely larger than was reported for 1850.

The area in total harvested crops has exhibited no consistent trend, being essentially the same in 1930 as in 1880. The acreage in corn and small grain, however, has shown a noticeable decline, while hay has more than doubled in terms of acreage and tripled in terms of percentage of the total acreage in harvested crops.

Changes in the number of livestock in 4-a have been similar to those reported for the state as a whole (Figure 3).

Table 10. Characteristics of Farming in Area 4, Urban-Influence Area (Truck-Fruit-Dairying Area).¹

Item	Area 4	Subarea 4a	Subarea 4b
	Percent	Percent	Percent
Percentage of state in the area	3	1.5	1.5
Percentage of the area in farm land	72	82	65
Percentage of farm land in:			
Crops harvested	34	29	40
Idle, failure, and fallow	10	8	12
Total crop land	44	37	52
Plowable pasture	22	26	17
Woods pasture	7	7	6
Other pasture	18	23	15
Total pasture	47	56	38
Woods not pasture	3	2	4
Other farm land	6	5	6
Total farm land	100	100	100
Woods pasture	7	7	6
Woods not pasture	3	2	4
Total woods	10	9	10
Total crop land	44	37	52
Plowable pasture	22	26	17
Total tillable land	66	63	69
Corn	11	8	14
Wheat	2	2	3
Other small grain	2	2	2
Total small grain	4	2	5
Tobacco	1	1	2
Fruit, truck, potatoes	6	4	8
Legume hay	5	6	5
Non-legume hay	7	8	5
Total hay	12	14	10
Cotton	—	—	—
Remaining crops	—	2	3

¹ From U. S. Census, 1930. Selected samples as follows: Area 4. Campbell, Jefferson, and Kenton. Subarea 4a. Campbell and Kenton counties. Subarea 4b. Jefferson county.

² Less than half of one percent.

Table 10. Characteristics of Farming in Area 4, Urban Influence Area¹ (concluded).

Item	Area 4	Subarea 4a	Subarea 4b
	Number	Number	Number
Numbers of livestock per 1000 acres of farm land:			
Dairy cows _____	60	63	58
Beef cows _____	2	2	2
Other cattle _____	33	34	31
All cattle _____	95	99	91
Sows and gilts farrowing _____	3	3	3
Other hogs _____	46	36	56
All hogs _____	49	39	59
Sheep and lambs _____	67	103	30
Poultry _____	740	814	664
Horses _____	20	25	15
Mules _____	11	5	16
Horses and mules _____	31	30	31
	Percent	Percent	Percent
Percentage of the total gross value of products:			
Crops _____	39	26	49
Livestock _____	14	17	12
Livestock products _____	30	35	25
Forest products _____	2	2	2
Household use _____	17	22	14
Total _____	100	100	100
	Dollars	Dollars	Dollars
Gross value of products per acre	24.00	21.00	27.60
Value of land and buildings per acre	151.00	105.00	197.00

AREA NO. 5. PENNYROYAL PLAIN. TOBACCO-LIVESTOCK AREA

The plain-like area along the southern border of Kentucky, extending south from Warren county to the Tennessee line and westward into Caldwell and Lyon counties, takes its local name, "Pennyroyal," from a fragrant mint-like plant common to the area. Topographically, this is the most favorable agricultural area in the state, since the surface of this section is probably more consistently level than that of any other part of Kentucky, with the possible exception of the areas of bottom land along the Ohio and Mississippi rivers.

The dominant crop of the Pennyroyal Plain is tobacco. The farming, however, differs in many respects from that in the

immediately adjacent tobacco-growing areas inasmuch as the soils are of better quality and the farms are generally larger. The farming approaches that of the Bluegrass in excellence, yet here bluegrass does not dominate the landscape. The explanation of this lies in the fact that the soils of the Pennyroyal Plain are not so productive as those of the Bluegrass Area, and the bluegrass plant does not thrive here unless the soil has received special treatment. This, in turn, is explained by the lower content of calcium phosphate in the parent limestone from which the soils of the Pennyroyal were derived and by the smaller amount of organic material.

Drainage in the Pennyroyal Plain is largely dependent upon underground systems. This area is crossed by only one stream of major importance, in striking contrast with the area to the north which is a maturely dissected plateau separated from the Pennyroyal Plain by a well-defined escarpment. (See Fig. 5.) This drainage feature of the Pennyroyal has resulted in many sinks which dot the landscape, giving the surface a slightly billowy appearance, and produce considerable waste land, where the drainage is poor or the sides too steep for cultivation.

The soils of the Pennyroyal Plain are residual, having been derived from limestones of the St. Louis formation. Considerable variation is noted in the color and texture of these soils, due to differences in the parent materials and in drainage conditions. On the whole, however, the surface soils are grayish brown or brown to reddish in color, crumbly, loose, and easily worked. The subsoils are characteristically red but have a yellowish, clayey appearance in some areas of poor drainage. Chert fragments are characteristic of the subsoils and occasionally appear on the surface. The soil in most sections is so loose that it erodes easily, and as a result the exposure of the subsoil is common in large areas.

Tobacco markets in such cities as Hopkinsville, Bowling Green, Russellville, Elkton, Horse Cave, and Princeton are available to the farmers. Rail connections are good, and main auto roads are accessible from most farms, with only a short haul

over secondary roads. Because of favorable topography road construction is relatively inexpensive.

Markets for dairy products are situated in several of the local cities and in Owensboro, Henderson, and Louisville. This area, like the Pennyroyal farther east, is tributary to the market centers of Tennessee, the cities of Clarksville and Nashville drawing a share of the tobacco and the dairy and poultry products.

Formerly only dark tobacco of the one-sucker, Clarksville, and Hopkinsville types was produced in this area. However, with low prices for dark and fair prices for white burley, burley has practically replaced other types in the eastern part of this area. It is likely, however, that further increases of this crop will come very gradually, if at all.

Practically all work other than that supplied by the operator and his family is done by negroes. About half of this outside labor is hired on a wage basis and half on a crop share basis. For the most part, the share labor is connected with the production of tobacco, the usual share given to the cropper being half the crop.

The social structure of this area dates back to the first half of the 19th century when a slave economy of the southern type became firmly established (Fig. 1). This is reflected today in the system of land tenure whereby a very large proportion of the farm labor is supplied by croppers. Continuous cropping, inadequate cultivation, and insufficient livestock have resulted in soils that are now in an advanced state of depletion. The production of the principal cash crop, dark tobacco, evidently has persisted despite such methods, for there has been little incentive for a change. These influences give rise to an outstanding difference between the type of farming here and in the Bluegrass, especially, the Inner Bluegrass; namely, the presence of bluegrass pastures in the latter and their scarcity in the Pennyroyal Plain.

A favorable topography and adaptable soils contribute to the large percentage of the total land in farms (Table 6) and the fact that a large part of the land in farms is tillable. De-

cidedly a larger share of the farm land is classified as idle, fallow, or failure than would be expected, considering the favorable physical features. This can be explained, at least in part, by the fact that the topography is broken by sinks, many of which offer some obstruction to farming, and many fields have been depleted of their fertility as a result of over-cropping. Altho pastures occupy approximately the same area of the farm land as crops (Table 6), the productivity of the former is lower because pastures on tillable land, in order to compete with crops, must be highly productive. Highly productive pastures of the bluegrass type can be had on highly phosphatic soil, but such soil is not naturally present here.

With pasture productivity low in relation to crop productivity, the strong tendency in the direction of crops is to be expected. A large percentage of the farm land is in corn (Table 6). Tobacco, wheat, and legume hays are of about the same relative importance here as in the Bluegrass Area.

Grain crops are more important and dairy cattle less important here than in such sections as the Bluegrass and the areas of urban influence. Hogs are relatively more numerous than in the areas of greater grass production but are not so numerous in the Pennyroyal Plain as in the areas, such as the Lower Ohio Valley, where corn is decidedly more important. Sheep are of slight significance, but beef cattle are of some importance. Poultry is to be found on nearly every farm in this region altho it is largely limited to the needs of the home. On the whole, most of the energy on farms in this area is directed toward the production of field crops; namely, tobacco, corn, wheat, and hay. Further evidence of the importance of crops in the farming of this area is found in the fact that half the gross value of products is from this source. Items for household use and livestock and livestock products account for the remaining part. Land values are approximately equal to the average for the state.

Three divisions of the Pennyroyal Plain are shown on the Type-of-Farming Map (Frontispiece). The topographic fea-

tures and therefore the farming of these subareas are somewhat different.

The farms in the eastern portion are generally smaller than those in the middle or western sections. More emphasis is placed on livestock, especially dairy cattle, and considerably less emphasis upon grain for sale; strawberries and tobacco are of importance. Land values are higher, and the gross value of products per acre is greater (Table 11).

Table 11. Characteristics of Farming in Area 5, Pennyroyal Plain, and its subdivisions (Tobacco-Livestock Area).¹

Item	Area 5	Subarea 5a	Subarea 5b	Subarea 5c
	Percent	Percent	Percent	Percent
Percentage of state in the area	5.2	2.5	1.7	1
Percentage of the area in farm land	92	94	92	90
Percentage of farm land in:				
Crops harvested	36	38	36	32
Idle, failure and fallow	10	9	11	12
Total crop land	46	47	47	44
Plowable pasture	31	28	26	23
Woods pasture	4	6	3	6
Other pasture	3	8	6	7
Total pasture	38	42	35	36
Woods not pasture	9	6	7	9
Other farm land	7	5	11	11
Total farm land	100	100	100	100
Woods pasture	4	6	3	6
Woods not pasture	9	6	7	9
Total woods	13	12	10	15
Total crop land	46	47	47	44
Plowable pasture	31	28	26	23
Total tillable land	77	75	73	67
Corn	17	18	17	16
Wheat	2	2	2	1
Other small grain	2	3	2	2
Total small grain	4	5	4	3
Tobacco	4	4	7	3
Fruit, truck, potatoes	1	1	2	2
Legume hay	2	3	2	2
Non-legume hay	6	7	5	5
Total hay	8	10	7	7
Cotton	—	—	—	—
Remaining crops	2	2	1	3

¹ From U. S. Census, 1930. Selected samples as follows: Area 5, as in footnote 1, Table 6. Subarea 5a. Magisterial Districts; Metcalfe, No. 2, Hart, No. 3, Barren, Nos. 4, 5, and 6, Warren, Nos. 1, 2, 3, 4, 6, and 7, Simpson, Nos. 1, 2, 3, and 4. Subarea 5b. Magisterial Districts; Logan, Nos. 2, 3, and 6, Todd, Nos. 5 and 8, Christian, Nos. 4 and 5, Trigg, No. 5. Subarea 5c. Magisterial Districts; Trigg, Nos. 2, 3, 4, 6, and 7. Lyon, No. 1, Caldwell, Nos. 1, 4, and 6.

² Less than half of one percent.

Table 11. Characteristics of Farming in Area 5, Pennyroyal Plain, and its subdivisions (Tobacco-Livestock Area)¹ (concluded).

Item	Area 5	Subarea 5a	Subarea 5b	Subarea 5c
	Number	Number	Number	Number
Numbers of livestock per 1000 acres of farm land:				
Dairy cows	27	37	25	20
Beef cows	3	3	3	2
Other cattle	23	38	26	23
All cattle	53	78	54	45
Sows and gilts farrowing	6	6	5	5
Other hogs	64	64	50	45
All hogs	70	70	55	50
Sheep and lambs	30	35	30	25
Poultry	350	450	300	275
Horses	9	10	8	8
Mules	18	18	19	16
Horses and mules	27	28	27	24
	Percent	Percent	Percent	Percent
Percentage of the total gross value of products:				
Crops	50	41	60	45
Livestock	18	24	14	19
Livestock products	14 ₂	17 ₂	10 ₂	13
Forest products				1
Household use	18	18	16	22
Total	100	100	100	100
	Dollars	Dollars	Dollars	Dollars
Gross value of products per acre	13.00	14.00	12.00	9.00
Value of land and buildings per acre	43.00	52.00	42.00	24.00

The middle portion has many very large farms. The large proportion of the gross value of products derived from crops in 1929 shows their importance. Livestock contributed a smaller share of the gross value of products here than in either of the other two subareas (Table 11).

Of the three subareas, the western one shows the lowest land values and the lowest gross value of products per acre. Less emphasis is placed upon crops and more on livestock than in the middle portion, but the proportion of gross income from crops is not so low as in the eastern part, nor does the proportion from livestock and livestock products in the west equal the figures for the east. This situation is brought about by the

slightly higher proportion of the farm land in woods and the smaller proportion in tillable land than is found in either of the other two subareas. The farms are intermediate in size in comparison with farms in the other two subareas (Table 11).

The total acreage in farms, improved land, and crop land in farms in Area 5 has probably changed but little in the past 50 years, in contrast with increases and decreases in other parts of Kentucky. The corn acreage has remained about the same. Since tobacco has always been an important crop here, the increase in tobacco acreage since 1880 has not been so great as in other parts of Kentucky. The decline in small-grain acreage, characteristic of Kentucky in general, probably has not been so great in the Pennyroyal Plain. Strawberries have been of importance in the central subarea, but the total acreage of this crop is probably on the decline, while it is increasing in the eastern portion of the Pennyroyal. Cotton has disappeared entirely. In most sections beef cattle have been replaced by dairy cattle to some extent but they are now increasing in importance again, especially on the larger farms and in the central subarea of the Pennyroyal.

Because the boundaries of the Pennyroyal Plain do not conform to county lines it has not been possible to establish the definite trends in the agriculture of this area by using census figures. It is apparent that changes have taken place and are worth noting, even tho absolute figures are not available.

AREA NO. 6. WESTERN COAL FIELD. SUBSISTENCE-TOBACCO AREA

The type of farming here may be termed a subsistence-tobacco type. Of the small amount of land in farms only a little over half is used for production. Crops and pasture are approximately equal in area, and the productivity of both is low. Corn is the major crop in acreage, but tobacco is more important on the basis of gross farm receipts, since the corn is used for the needs of the family as well as for those of the mule, the cow, the pig or two, and the poultry. Part-time work in the

coal mines or oil and gas fields is important for many of the farmers.

The character of the farming here has much in common with that of the "mountains." Geologically, the areas are similar, being now separate parts of a formerly united area. A number of differences appear, however, justifying their separate treatment, one being the presence of tobacco as a cash crop.

Area 6 includes much of the coal measure territory of the western part of the state and particularly that part lying toward the center of the state. Included also are the Chester sandstone areas between the Western Coal Field proper and the Pennyroyal Plain. The topography is rolling to rough, in general, however, the slopes are not steep, the ridge tops are rounded, and the valley bottoms are wide. The soils are of sandstone and shale origin. Both topography and soil are unfavorable to a highly productive agriculture, especially if too large a proportion of the land is cropped in corn or tobacco.

Attention should be drawn here to the fact that the Western Coal Field, as a geological unit, includes large areas of bottom land, the effect of ponding of the river valleys in a previous geological period. This ponding resulted in the deposition of silty material in the valleys, giving rise to large areas of level land of high fertility. Much of this bottom land is still swampy and covered with trees. Some of it has been drained thru large public drainage projects, and in these sections the type of farming departs radically from that of the neighboring uplands with their rough topography and poor soils. As blocked out, the Western Coal Field as a type-of-farming area includes some of this bottom land, but it is not intended that this should be included in the type of farming described here.

Markets are available to farmers of this area in both the nearby mining towns and the more distant cities. Transportation is possible by railways serving the mining towns and by the major highways. The interior roads, however, are still poor and, under the influence of the rough topography, make regular marketing facilities, such as are necessary with milk or quality

cream, difficult or impossible. Tobacco can be hauled out by wagon to the main roads where it is reloaded on trucks and transported to such markets as Hopkinsville, Bowling Green, and Princeton, or Madisonville, Henderson, and Owensboro.

The land use of this area is indicative of low agricultural productivity. Of the total land area, approximately two-thirds is in farms. This low proportion is due partly to ownership by coal companies but in greater measure to the rough topography and poor soil (Table 6).

Barely half of the farm land is reported as tillable. An element tending to lower the amount of tillable land of this area is the large proportion of the farm land in woods. Altho approximately two-fifths of the farm land is reported as potential crop land, idle land reduces the proportion in crops harvested to less than one-third of the farm land (Table 6). One-fourth of the farm land is in pasture.

Corn makes up four-fifths of the crops other than hay. It is largely a subsistence product, being used for the family needs as well as for the few livestock and poultry. The products used in the household represent over one-third of the gross value of products of the farm. The inclusion of tobacco, however, on the average Western Coal Field farm, makes the farming somewhat commercial.

The small proportion of legumes and the larger proportion of other hay (largely redtop and wild and other grass hays) reflects the acidity and low productivity of the soil. A large proportion of annual legumes indicates an effort to overcome adverse soil conditions.

The area cannot be considered a livestock area on the basis of numbers. The number of milk cows barely amounts to a cow or two per farm, after allowing for a few of the more definitely specialized dairy herds near the mining camps or larger towns. The dairying is thus the home-use type, with occasionally a little surplus butterfat for sale.

When similarly judged by figures for beef animals, the area cannot be considered as an important beef-producing

region. Swine are likewise few, in keeping with the small amount of grain produced. The low yield and small acreage of corn give little more than is necessary for household use. The area ranks low in the number of sheep and lambs principally because of poor pastures and predatory dogs. Poultry, altho a minor enterprise on most farms, is relatively more important here where other livestock enterprises are still more limited.

Indicative of the low productivity of Area 6 is the low gross value of products per acre of farm land: \$7. One-fourth of this is credited to crops and a trifle over a fourth to livestock and livestock products, while nearly half is devoted to the use of the farm families. Forest products are relatively more important here than in other areas. The section has much woods, and the coal mines afford a market for timber in the form of ties and mine props.

Real-estate values here are the lowest in the state, averaging \$22 per acre for land and buildings. The value of machinery per acre is also low since it cannot be used very effectively on the rough topography and consists principally of hand tools or small horsedrawn implements. Corn and tobacco are better suited than any other crops to this situation.

Historically, the development of farms in Area 6 has been similar to that reported for the state as a whole, except for the fact that tobacco today occupies about the same position as in 1880, in contrast with an increase for the state as a whole. The numbers of hogs, sheep, and all cattle have declined consistently since 1850, while dairy cattle have shown some increase.

AREA NO. 7. LOWER OHIO RIVER VALLEY. CORN-LIVESTOCK-TOBACCO AREA

The farming here includes a corn-livestock type, in the more westerly part of the area centering in Union county, and a tobacco-corn-livestock type, in the eastern part centering in Henderson and Daviess counties, with considerable attention to crops and feeder livestock on the bottom lands. (See Table 12.) This is highly a commercial type of farming area. Corn is the major crop in both parts of the area, tho small grain, particu-

larly wheat, is important; tobacco is a minor crop in the western part but makes an important contribution to the farm income in the eastern section. The western part is more a livestock area.

The surface consists of rolling uplands and broad, level bottoms. The latter were originally swampy and covered with trees. Much of the bottom land has been drained, but considerable drainage and clearing remains to be completed. The uplands include a very definite stream pattern, with gentle slopes leading down from the divides.

The soils of the uplands are yellow, silty to sandy loams, largely loessial in origin and very productive, especially those found nearer the Ohio River. Farther away from the river the depth of these loessial soils decreases, and they are apparently less productive. The bottom-land soils are highly productive silty and clay loams. Altho much of the coarser silty material in the bottom land soils originated in the nearby Pennsylvania sandstones, a great deal of fine calcareous material has been brought down by the river and has added much to the fertility of the soils.

Markets for the tobacco of the area are available in Henderson and Owensboro, originally important river towns, and in Madisonville, an important city in the coal area. Livestock are marketed at more distant centers. Excellent transportation facilities are offered by the railroads and trucks.

The land use in this area indicates a high state of productivity on both uplands and bottoms. Of the total land area 80 percent is in farms, and more than three-fourths of this is tillable. Of this tillable land, over half is in harvested crops; in the bottom lands the proportion is more than three-fifths. The upland districts have over twice as much land in pasture as the bottoms, having apparently developed a cropping system with considerable pasture on land which is plowable. The use of this pasture for livestock, in combination with the crops on the uplands, is significantly different from that on the bottom lands because the latter has relatively and absolutely much more cropping. The high state of fertility of the alluvial bottoms permits

this heavy cropping in corn without the usual rest period so necessary on less fertile soil.

Corn, representing slightly more than one-half of the harvested crops, is the major crop on the uplands, and the proportion of the land devoted to it here is larger than that in any other area in Kentucky. Hays, most of which are of the legume type, small grains, and tobacco occupy less than one-fifth of the farm area.

The number of cattle, whether beef cows, steers, or other cattle, approximates the average for the state. Swine are the most important livestock, the number of sows and gilts and total swine being equaled nowhere else in the state. There are only a few sheep, and poultry is a minor enterprise. The number of livestock on the bottom lands tends to run high in animals using concentrates, such as hogs and feeder cattle, but less in pasture-using animals, such as beef cows and sheep. Some dairying is practiced where the location is favorable for marketing and where sanitary conditions are possible.

The gross value of products is \$13 per acre of farm land. That this is a truly commercial farming area may be judged by the facts that less than one-sixth of this is attributed to products for household use and that the valuation of land and buildings is about the same as the state average.

The type of farming found in the eastern section of Area 7 differs enough from that in the western section to warrant separation of the area into two parts. They do not differ greatly in the percentage of land in farms, the proportion of land that is tillable, or the proportion of crops harvested. The eastern section, however, has about one-fourth of its land in pasture, the western section over one-third. Other differences are shown in specific crops, notably small grains, which are more important in 7-b, and tobacco, which is more important in 7-a. Other relationships are essentially the same.

In Subarea 7-b the item, of all cattle, appears more important because of the very large number of beef cows. The figures for these and for hogs exceed the figures for all other parts of the

state. This is a corn-producing area with corn-consuming livestock high in number; moreover, large quantities of corn are sold as cash grain. Union county agriculture more nearly approaches the corn-belt type of farming than does that of any other area in Kentucky.

Value per acre of farm land and the gross value of products per acre do not differ greatly within these two subareas. In Subarea 7-a, however, over half of this gross value is derived from crops and less than one-third from livestock, while less than one-third of the returns on farms in Subarea 7-b is from crops and

Table 12. Characteristics of Farming in Area 7, Lower Ohio Valley, and its subdivisions (Livestock-Tobacco Area).¹

Item	Area 7	Subarea 7a	Subarea 7b
	Percent	Percent	Percent
Percentage of state in the area	6	3.0	3.0
Percentage of the area in farm land	83	83	87
Percentage of farm land in:			
Crops harvested	44	45	47
Idle, failure, and fallow	12	13	9
Total crop land	56	58	56
Plowable pasture	22	21	29
Woods pasture	3	3	3
Other pasture	5	4	4
Total pasture	30	28	36
Woods not pasture	5	5	3
Other farm land	9	9	5
Total farm land	100	100	100
Woods pasture	3	3	3
Woods not pasture	5	5	3
Total woods	8	8	6
Total crop land	56	58	56
Plowable pasture	22	21	29
Total tillable land	78	79	85
Corn	25	25	28
Wheat	3	2	5
Other small grain	1	2	2
Total small grain	4	4	7
Tobacco	4	5	1
Fruit, truck, potatoes	2	1	2
Legume hay	2	3	3
Non-legume hay	7	7	7
Total hay	9	10	10
Cotton	—	—	—
Remaining crops	2	2	1

¹ From U. S. Census, 1930. Selected samples as follows: **Area 7**, as in footnote 1, Table 6. **Subarea 7a**, Daviess, Henderson, and McLean counties. **Subarea 7a**, Union county.

² Less than half of one percent.

Table 12. Characteristics of Farming in Area 7, Lower Ohio Valley, and its subdivision¹ (concluded).

Item	Area 7	Subarea 7a	Subarea 7b
	Number	Number	Number
Numbers of livestock per 1000 acres of farm land:			
Dairy cows	23	23	20
Beef cows	4	2	12
Other cattle	24	20	44
All cattle	51	45	76
Sows and gilts farrowing	11	9	22
Other hogs	105	89	195
All hogs	116	98	221
Sheep and lambs	23	19	33
Poultry	410	440	341
Horses	14	15	11
Mules	21	22	19
Horses and mules	35	37	30
	Percent	Percent	Percent
Percentage of the total gross value of products:			
Crops	48	54	28
Livestock	23	17	48
Livestock products	12	12	11
Forest products	1	1	1
Household use	16	16	13
Total	100	100	100
	Dollars	Dollars	Dollars
Gross value of products per acre	13.00	14.20	13.00
Value of land and buildings per acre	51.00	56.00	54.00

nearly two-thirds is from livestock, emphasizing the large number of beef cattle and hogs on these farms. Altho the proportion of gross value of products utilized on the farms is very low, considering the figures for the state as a whole, this proportion is somewhat greater in 7-a, largely because farms here are smaller than those in 7-b.

In contrast with increases in tobacco acreage for the state as a whole, the tobacco acreage in Area 7 has changed but little in the past 50 years. Altho there has been some decline in the acreage of small grain and an increase in the acreage of hay, adjustments in these crops have not been so marked as in the state as a whole.

Hogs have not declined so much, and the number in Sub-

area 7-b actually exceeds the number in 1880. Dairy cattle have increased in both subareas but to a greater degree in 7-a, and the trend in the number of sheep has been downward.

AREA NO. 8. PURCHASE REGION. TOBACCO-GENERAL-FARMING AREA

Altho the farming in the Jackson Purchase⁹ presents a varied agricultural picture, it is characterized as a tobacco type. In the southwestern section cotton is the important crop, while in the vicinity of Paducah truck, fruit, and potato crops are more in evidence. Tobacco is of considerable importance as a source of cash income in much of the remainder of the Purchase, especially in the better areas. Minor enterprises entering into the organization of farms in this area are dairy cows, hogs, poultry, and some sheep.

The elevation of the uplands of this area is considerably less than in the rest of Kentucky, and there are no high hills or mountains. Much of the surface, however, is rendered uneven by large streams, deep ravines, and gullies, because the soil is particularly subject to gully erosion. The land is almost free from rocks and rock fragments.

The soil of this area is distinguished from that of other areas by its origin. Purchase soil, especially that of the uplands, is made up of transported material (loess), while soil in other parts of the state was formed largely from rock formations not unlike the present underlying rocks. The soil of the Purchase Area, as a rule, is deeper and looser than that of other areas.

One of the distinct handicaps to the social and agricultural development of the Purchase has been transportation. Railroad and river transportation was adequate, but the highway system was very inadequate until recent years. Thus farms were limited to the production of salable products of a high value and small proportionate bulk. With roads impassable most of the year, farmers had few opportunities to introduce farm enter-

⁹ Eight counties lying west of the Tennessee river, acquired by purchase from the Chickasaw Indians in 1818, thru the efforts of General Jackson.

prises supplementary to tobacco and thus to improve their incomes. Thru the effort of the federal, state, and county governments, considerable improvements have been made recently in roads. The region now has a network of roads which is being improved at a rapid rate, so that most farmers will soon have access to an all-weather road. This will do much toward enabling farmers to develop farm enterprises that utilize their resources more effectively.

Tenancy, particularly in the more specialized tobacco-growing district, is very high. For the most part, the rental is on a crop-share basis. The tenant or cropper in the Purchase, however, usually grows some corn on shares, in addition to his tobacco crop. The growing of corn is more important and the acreage of corn on tenant tracts is greater in this and other dark-tobacco sections than in the burley belt, the most important reason for this being the low value of the dark-tobacco crop. The limited tobacco acreage possible per tenant makes necessary the addition of a subsistence crop, such as corn, for household use.

A large share of the total land in the eight counties of the Purchase is in farms (Table 6). Of the land in farms, about three-fourths is classified as improved or tillable, one-seventh is woodland, and the remainder consists of building sites and waste. The proportion of woodland is slightly larger than in much of the state, and the amount of waste land is also proportionately greater. This is explained by the large areas of poorly drained bottom land that are not suited to agricultural use to any great extent, yet are included in the farm acreage. Poor drainage also accounts for the fact that a much larger share of the tillable land is classified as idle and crop failure than in other sections of the state. Since much of the bottom land is subject to overflow, the harvesting of crops is made somewhat uncertain (Table 6).

Land in harvested crops occupies about one-third of the area in farms and land in pasture somewhat less. Corn is by far the most important crop. The proportion of farm land in

tobacco is very low, but in the sections of the Purchase where it is really an important crop, the proportion equals the highest figures for the other tobacco-growing areas (Table 13).

Legume hays are probably more important in the Purchase region, in relation to other kinds of hay grown, than in any other agricultural area in the state, with the possible exception of the areas near cities. The acreage in legume hay is practically equal to the acreage in other hays, whereas the acreage in legume hay in all other areas varies from one-fourth to one-half of the acreage in non-legume hays (Table 6). This is explained in part by the very general use of annual legume crops and by the great need for hay to feed the large number of dairy animals. Along with this large amount of hay in the Purchase is a correspondingly small amount of wheat and other small grains. This large proportion of hay land and small proportion of small-grain land may be attributed to the small size of the farm operations which, in turn, determine a relatively more intensive use of the land than small-grain growing. Such small grains as are planted for cover and nurse crops usually are grazed down and not harvested for grain.

Altho cotton plays a minor role, measured by the crop acreage of the Purchase as a whole, it occupies a very large proportion of the harvested crop acreage in the localities in the Purchase where it is produced. Truck and fruit crops likewise occupy a relatively small proportion of the farm land but, on farms where they are grown, they assume an important place in the farm organization, especially as concerns income.

Thus corn and hay, produced largely for livestock consumption on the farm, occupy four-fifths of the total crop area. The remaining fifth of the area in crops is almost entirely in cash crops, mainly tobacco, cotton, fruit, potatoes, and truck. Of these, tobacco is by far the most important, both in acreage and cash income.

There is considerable dairying in the Purchase (Table 13). This is largely explained by the small operator's need for an intensive enterprise to supplement the reduced income from to-

bacco, which has resulted from the drastic price reduction in dark tobacco that occurred some years ago and still continues. The dairy enterprise has proved to be a relatively profitable one. Creameries are located at Fulton and Paducah, and milk condenseries at Mayfield and Murray. In addition, cream is shipped to such points as Nashville, Tennessee, and Evansville, Indiana.

Judged by numbers, hogs are more important than beef cattle, when compared with figures for the remainder of Kentucky. Both are more or less concentrated in the sections having a relatively large production of corn. In such areas the number of sows, and gilts is double and treble the average. Hogs in much of the remainder of the Purchase are for home consumption only. The Purchase ranks very low in the number of sheep, because of the small amount of pasture and the use by dairy cattle of such pasture as is available. Chickens, for the most part, are kept in small flocks which fit in well with the other farm enterprises. Turkeys and other kinds of poultry are of minor importance.

From the foregoing data it is evident that dairy cattle, hogs, and poultry are the important classes of productive livestock in the Purchase. Figures showing gross value of products for the Purchase are somewhat higher than similar figures for the coal-mining areas and for the eastern Pennyroyal but lower than those for other areas of the state.

In value of land and buildings per acre the Purchase Region ranks below all other areas of the state except the two coal fields.

Agricultural possibilities and resulting standards of living are considerably different in various localities of the Purchase, so it has been divided into six subareas. (See Frontispiece.)

The Bottoms (Subareas 8-a and 8-b). Surrounding the Purchase on the east, north, and west, along the Tennessee, Ohio, and Mississippi rivers, are the sections known as the Bottoms (Subarea 8-a) and Big Bottoms (Subarea 8-b). These subareas are mostly very narrow and somewhat irregular but have the uniform characteristic of being a flood plain of overflow land

and, except where levees have been built, are flooded during periods of high water. Consequently, few farm buildings are located in these areas, the farmsteads being situated on the adjacent second bottoms or hills. If livestock are kept, the location of farm buildings back from the bottoms becomes doubly important, and where the number of livestock is large some additional upland is necessary so that sufficient grazing and hay may be provided.

The farming on the bottoms of the Tennessee, Ohio, and most of the Mississippi is limited largely to growing corn. Yields are good, and often the same field is put into corn year after year. Some other crops may be produced, such as soybeans for hay, but little land is left for them. Much of the land is in woods or is idle because of insufficient drainage.

The bottoms along the Mississippi are decidedly broader than those of either the Ohio or Tennessee, especially in western Hickman and Fulton counties. Here they are known as "Big Bottoms" and are distinguished from the bottoms in other areas by the fact that levees have been built and farm buildings are located on the river flood plain. The farming is also decidedly different from that of the other bottom areas since the only strictly cotton farms in Kentucky are located here. A considerable portion of the tillable land is in this crop. The farms are large and the fields large and level. Much of the labor is furnished by negro cropper tenants, and the type of farming takes on many of the characteristics of the cotton-plantation farming of the south. In addition to cotton, alfalfa, wheat, and corn are raised. Almost no pasturing is done, and little livestock is kept beyond the immediate needs of the farm. The agriculture is classified as a cotton-cash-corn type of farming (Table 13).

The Big Bottoms of the Jackson Purchase are the most productive of all the Purchase area. The value of land and buildings per acre is above similar figures for other subareas of the Purchase. Altho the full agricultural use of these lands can follow only after considerable improvement by draining or by

the use of levees, the area as a whole is of superior agricultural quality in comparison with other Purchase subareas (Table 13).

Subarea 8-c. After crossing the bottoms along the Tennessee, moving westward into the Purchase Region, the terrain immediately becomes very rough, with steep hillsides and narrow ridges. This is an area of little agriculture, where one-third or more of the farm land is in timber and less than half is classified as tillable. Such farming as is attempted is forced into the bottoms along small streams, largely because of the low fertility of the hillsides and the large amount of erosion. Altho some of these bottoms are of sufficient extent to permit fields of 10 to 15 acres or larger, there are only small amounts of bottom land, and the area that may be cropped is decidedly limited. The total acreage of the average farm is usually large, but only a small proportion is devoted to harvested crops. The remainder is of little value for grazing or any other agricultural use (Table 13).

The principal crop is corn. This is utilized mainly in supplying home needs; some is fed to the few hogs on hand, and a small proportion may be available for sale. A few dairy cattle are kept, and the small surplus of butterfat is sold. Beef cattle are rare. Some dark fire-cured tobacco is raised but it is of low quality and, relative to other sections of the Purchase, unimportant (Table 13). Grass hays predominate, and pastures are poor. Yields of all crops are low.

Subarea 8-d. As shown in the frontispiece, the area known as the Oak and Hickory Uplands is by far the largest in the Purchase, making up roughly half of the total area. The name applied to this subarea refers more to original-forest cover than the present land use. The section is distinguished from the Breaks of the Tennessee area inasmuch as the terrain here is not quite so rough, the ridges somewhat broader, and the slopes less steep, altho the topography is still classed as rough. Thus the surface is better adapted to cultivated crops and the soil possibly a little more productive. Probably not more than one-

seventh of the farm area is in woods, and at least two-thirds of the land in farms is classified as tillable.

Corn, again, is the most important crop. Legume hays predominate, but other hay probably is less important than for the area as a whole. Dark tobacco is produced with somewhat better success than in the Breaks, yet the Oak and Hickory hills can hardly be classed as a tobacco area.

Dairy cattle are relatively important in this area but do not approach the figure for the Barrens (Subarea 8-e). Likewise, sheep are somewhat more numerous here but still considerably below the figure for the Cane Hills (Table 13).

The farms are generally small so that the individual operator is forced into considerable over-cropping of land, resulting in badly eroded fields. It is an area of low productivity, tho somewhat better than the area previously discussed. The farming here is characterized as a corn-tobacco type of farming. In both subareas just described the farm buildings are of a primitive character, consisting largely of hewn logs and hand-split shingles, and land values are low.

*Subarea 8-e.*¹⁰ The Barrens is decidedly an area of favorable topography and better soils. This area has less woods and a larger proportion of tillable land than most of the Purchase, tho figures for the Cane Hills equal these. Considerably more of the farm land is in harvested crops than is in pasture. Corn is by far the most important crop in acreage, but tobacco occupies a much larger proportion of the acreage than elsewhere, and the income from this represents a much larger proportion of the total farm receipts than it does in other parts of the Purchase Region. Legume hays equal or exceed all other hays. Other crops such as truck, small and tree fruits, and sweet potatoes are produced in considerable quantity in some localities. Strawberries particularly are of importance on some farms. Dairy cattle are more important here, and the quality of feed crops produced is much superior to that of the Breaks of the Tennessee or the Oak and Hickory Uplands. Hogs are of

¹⁰ See explanatory note accompanying Frontispiece.

Table 13. Characteristics of Farming in Area 8, The Purchase, and its subdivisions (Tobacco-General-Farming Area).¹

Item	Area 8	Subarea 8a	Subarea 8b	Subarea 8c	Subarea 8d	Subarea 8e	Subarea 8f	Subarea 8g
Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Percentage of state in the area	6	75	70	80	2	88	86	78
Percentage of the area in farm land	81				80			
Percentage of farm land in:								
Crops harvested	36	40	68	24	33	42	40	33
Idle, failure, and fallow	14	22	12	13	14	15	12	17
Total crop land	50	62	80	37	47	57	52	50
Plowable pasture	22	18	5	11	20	25	28	18
Woods pasture	4	1	3	10	7	3	13	4
Other pasture	4	2	1	4	3	1	4	2
Total pasture	30	21	9	25	30	29	45	24
Woods not pasture	11	15	10	20	6	6	2	12
Other farm land	9	2	1	18	17	8	1	14
Total farm land	100	100	100	100	100	100	100	100
Woods pasture	4	1	3	10	7	3	13	4
Woods not pasture	10	15	10	20	6	6	2	12
Total woods	14	16	13	30	13	9	15	16
Total crop land	50	62	80	37	47	57	52	50
Plowable pasture	22	18	5	11	20	25	28	18
Total tillable land	72	80	85	48	67	82	80	68
Corn	19	35	24	15	18	20	23	19
Wheat	1	2	3	2	1	1	2	1
Other small grain	1	1	1	1	1	1	1	1
Total small grain	2	3	4	1	2	2	3	2
Tobacco	3	1	2	2	3	6	2	1
Fruit, truck, potatoes	2	2	2	2	2	1	2	2
Legume	4	4	7	2	3	6	7	2
Non-legume hay	5	2	2	5	5	5	4	8
Total hay	9	4	9	7	8	11	11	10
Cotton	1	2	30	2	2	2	1	1
Remaining crops	2	1	1	1	2	2	1	1

Numbers of livestock per 1000 acres of farm land:											
Dairy cows			Dollars			Number			Number		
2			15			25			35		
29			1			1			1		
64			30			46			65		
6			6			5			8		
62			62			52			31		
68			68			57			91		
27			200			2			15		
450			17			9			500		
13			18			29			14		
20			35			38			19		
33			35			38			33		
Percentage of the total gross value of products from:											
Crops			Percent			Percent			Percent		
44			50			65			44		
16			18			13			13		
18			9			8			26		
2			2			2			2		
22			23			14			17		
100			100			100			100		
Gross value of products per acre											
Value of land and buildings per acre			Dollars			Dollars			Dollars		
12.00			9.00			18.00			17.00		
33.00			28.00			18.00			59.00		

¹ From U. S. Census, 1930. Selected samples as follows: Area 8, as in footnote 1, Table 6. Subareas by magisterial districts: Subarea 8a, Ballard, No. 1, Subarea 8b, Fulton, No. 4, Subarea 8c, Calloway, Nos. 2 and 3, Subarea 8d, Carlisle No. 2 and Marshall No. 4, Subarea 8e, Ballard No. 2 and Graves No. 4, Subarea 8f, Fulton No. 2 and Hickman No. 2, Subarea 8g, McCracken No. 8.

² Less than half of one percent.

importance, not as a single enterprise but as supplementary to dairy cattle, thus more sows and gilts are kept in this area than in any other part of the Purchase Region, except the areas high in corn production. Poultry likewise is important as a small-farm enterprise utilizing surplus waste food and feed products and adding to the farm cash income. Thus with a fairly intensive system many small farms have developed in the Barrens. The average size is considerably below 100 acres. Tenancy is very prevalent, altho cropper tenants are limited almost entirely to the tobacco crop, most tenants raising, in addition to their tobacco, a small acreage of corn on shares. The appearance here is one of a fairly prosperous agriculture in contrast with the two areas discussed previously. The per acre value of land and buildings is intermediate (Table 13).

Farming on the Barrens in Calloway and Graves counties is very similar except that there is less emphasis on truck and fruit crops in Graves. The tobacco grown is a dark fire-cured type of good quality and yield. In central Ballard and western McCracken counties, white burley is the dominant type. Just why one type should be grown in one area and not in another is not altogether clear. Some report that the soil is better in the burley area. Others think that burley "just got started" and that habit prevails. In any event, with the declining prices for dark tobacco and more stable prices for burley, farmers have had little reason to maintain their dark tobacco acreage in this area, and with the skill developed and barns available for producing an air-cured type of tobacco white burley has been on the increase. Its production has not been extended into other areas of the Purchase, however, during this period. Local warehouses are available in the Purchase for sale of dark tobacco, whereas burley must be trucked eastward, much of it going to Owensboro. There is a dark tobacco cooperative in the Purchase.

Strawberry-shipping associations are located at Mayfield and Paducah and cream-collecting stations are distributed along all the main and county highways.

Altho the productivity of the Barrens does not approach

that of the Bottoms, it is distinctly better than that of the Breaks along the Tennessee or that of the Oak and Hickory uplands. Erosion, tho a problem, can be controlled without much effort, and such soil improvement practices as are necessary are not difficult and give surprising results. This is a tobacco-corn type of farming, combined with such other enterprises as dairying and truck and fruit crops. On the whole this may be said to be an area of agricultural promise, and tho not the best agricultural area, still one of considerable economic importance to the Purchase, because of its extent.

Subarea 8-f. Adjacent to the Mississippi river bottoms and extending eastward to the western border of the Oak and Hickory Uplands is an area known as the Cane Hills. Altho the topography here varies from very rough in the west and north portions to rolling and level in the east and south portions, the loessial soil is of high fertility, produces good yields, and supports a prosperous agriculture.

Forty percent of the land in farms is in harvested crops; the proportion of farm land in pasture is slightly higher than in other areas of the Purchase. Legume hays are important and exceed all other hays in acreage. Tobacco is relatively unimportant from the standpoint of land use. A few farmers grow some cotton. As in all other areas, corn is the important crop, the proportion of the farm area in this crop being higher only in the bottom areas (Table 13).

Dairy cattle, tho not so important as in the Barrens, are about as important as in much of the remainder of the Purchase. The number of hogs is larger than for any other subarea of the Purchase. Beef cattle are of minor importance, but sheep and lambs reach the largest numbers here. The large amount of livestock indicates productive crop and pasture land and marks this as a subarea ranking with the Bottoms as one of the best agricultural sections in the Purchase.

The per-acre value of the land and buildings is high. Farms are somewhat larger, especially in the southern portion, and may be said to embrace a general type of farming, with tobacco

and dairy and other livestock products as the principal sources of receipts. Some truck and fruits are produced. On the whole, this is an area of superior agricultural qualities relative to the whole Purchase Region.

Subarea 8-g. Along the northern border, adjacent to the Ohio river bottoms and extending into the interior in eastern McCracken county, is a broad, level area known as the Second Bottoms. This was formed as a flood plain of the Ohio when the level of the river was considerably higher than it is today. Because of lack of drainage this area is inferior in agricultural productivity to the Barrens but probably slightly better than the Oak and Hickory Uplands. Much of the land is in corn. Important crops produced for sale vary from small fruits, orchards, and truck crops in eastern and central McCracken county near Paducah to corn for cash grain in the western section. Little tobacco is produced in this area, tho it was of more importance in the past. Strawberries and raspberries are the most important small fruits. Apples are widely grown, and peaches have been produced, but there has been a poor market for the latter. Sweet potatoes are a crop of some importance. In the western portion of the subarea is a small truck area paralleling the Ohio river, crossing the Ballard-McCracken county line, and extending into each of these counties a short distance.

Some livestock are kept, especially dairy cattle, in the vicinity of Paducah, and there are some hogs. Sheep and beef cattle are unimportant.

Agriculturally the Second Bottoms are limited in their possibilities, judging by their present development. However, the farming as practiced today is a considerable improvement over that of a decade ago. The average value of buildings per acre was low in 1929.

The relationship of crops to each other has varied considerably in the past fifty years in the Purchase. Altho the relation of corn to the crop area has not varied greatly, small grains lost their important position in 1879 and hay has increased. The hay acreage in 1929 was ten times the figure for 1879 and small grain

one-eighth the 1879 figure. A comparison of these with similar figures for the state as a whole (Fig. 3) reveals that the increase in hay acreage and the decrease in the acreage of small grain is considerably more pronounced in the Purchase section than in the state in general. The amount of land in tobacco has increased by one-half of the original figures and now occupies a somewhat higher percentage of the crop area than formerly. Likewise the cotton acreage has shown an increase. Figures for small fruits, truck crops, and potatoes are considered too inaccurate to be used in this connection, but the acreage in all these has undoubtedly been on the increase during this period.

While dairy cattle have increased to almost twice the number of fifty years ago, the number of hogs has decreased by one-half. The number of sheep is practically unchanged. Although adequate data are lacking, it is known that poultry has been on the increase.

SUMMARY AND CONCLUSION

It is apparent that the agriculture of Kentucky includes many different types of farming. To a large extent these tend to be localized in areas of homogeneous character, termed type-of-farming areas. This is the result of localization of those forces which have acted together to bring about the types of farming which now prevail.

In any type-of-farming area, departures from the dominant type may be found. This is because of differences in the forces themselves, in their combination, or in the intensity of their action. These differences in the forces involved and in the resulting types of farming are important in understanding the agriculture of the state and why it appears as varied as it is. Differences in productivity and in attendant living conditions are apparent in traversing even relatively short distances. The recognition and thoro understanding of the limitations, handicaps, and advantages in any locality should go far toward stimulating the concern of farmers as well as business and professional men in their appreciation of the attendant agricultural pos-

sibilities. Desirable adjustment among the factors of agricultural production can be achieved only with careful study and considerable experience in observing the way in which they operate. Effective and immediate use of such an analysis should lead to an improvement in the position of Kentucky farmers, individually and collectively. The need for a consideration of effective changes that will lead to the wisest use of our agricultural resources is most urgent.